

THE NEW YORK SEA GRANT INSTITUTE  
OF  
THE STATE UNIVERSITY OF NEW YORK AND CORNELL UNIVERSITY



---

AN APPRECIATION OF ITS FIRST THIRTEEN YEARS

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New York Sea Grant Institute  
Albany, New York  
August 31, 1984



# Sea Grant Office Locations



# The New York Sea Grant Institute: A 13 Year Appreciation

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Selected Policies Adopted by the Governing Board  
New York Sea Grant Institute

December 11, 1970 (Ad Hoc Governing Board)

The budget for the proposal is to be appropriately sized prior to its submission to Washington, allowing for about a 10% overrun. "Decisions on program content should be made by the program and not relinquished to the Office of Sea Grant."

"The primary basis of projects should be the quality of the activity. A program of highest quality also achieving balance [among campuses] should be the objective. The Board also desires to commit a portion of the resources to the development of promising, inexperienced researchers."

Advisory Services should be funded at approximately 25% of the total program dollars. It is important to initiate a strong Advisory Services Program during the first year with emphasis on publicity for the program.

Program management costs are not to exceed 10% of total funding.

January 5, 1972

"We first support quality research, but we also give appropriate weight to breadth and distribution of program elements. We strongly back committing a portion of our resources to the development of promising, young, inexperienced researchers. This policy will be reviewed by the Governing Board annually, at which time it may be desirable to fund selectively several higher priority projects."

Faculty are to be permitted to charge 2/9 of their academic year salary for summer salary from Sea Grant.

Based upon the requirement for provision of matching funds, the New York Sea Grant Program should not permit released time payments to the campuses except in the endowed colleges of Cornell.

"The Governing Board recommends that wherever possible a project be required to provide matching funds amounting to 33 1/3% of the total cost."

"The Governing Board recommends that advisory services regional specialists develop appropriate relationships with a host campus to improve interrelationships between the community and the faculty, and believes that advisory services personnel will make a substantial contribution to the campuses on which this relationship exists. We therefore recommend that State University campuses make space available for the housing of advisory services personnel in recognition of the contribution that these personnel will make in the furtherance of community relations."



June 29, 1972

"Whereas the Governing Board of the New York State Sea Grant Program urges the State University of New York to obtain Sea Grant College status at the earliest possible date on behalf of the State University of New York and Cornell University, we therefore:

Request that the Chancellor initiate and lead negotiations with the New York State Legislature and Executive Offices for a 1973-74 appropriation of the necessary matching funds; and

Recommend that the method of administering this appropriation be the same as that established for the Federal grant, with the exception that the restrictions on the latter funds which preclude their use in certain categories of the Program's costs, be eliminated in the State appropriation."

December 6, 1972 [Meeting of the Subcommittee on Sea Grant College]

It is proposed to the Board as a whole, that Sea Grant College status in New York be as a "consortium college attached administratively to the State University of New York."

March 2, 1973

Revision of program administration, eliminating the Great Lakes and Marine Coordinators and creating the position of Executive Officer, to be housed in the Program Office, is approved. The Board suggests that the Sea Grant Cabinet be disbanded.

The title Associate Director is created to be held by the Program Leader, Advisory Services.

The Board directs that the proposal show matching funds in excess of federal requirement as a symbol of the universities' commitment. This policy is to be reviewed annually.

January 12, 1974

The Board was informed of the University's reluctance to initiate the proposed Sea Grant College. It agreed to pursue an alternate course such as an "institute."

May 23, 1974

"Individual campuses must justify matching funds to the Program Director's satisfaction, if below 50%."

"The Governing Board favors Traineeships over Research Assistantships, and calls for their establishment. The traineeships entail eligibility for tuition waiver, but are not in themselves such a guarantee." A uniform stipend, for all campuses is established, to be reviewed annually.

The proposal for the Sea Grant Institute is approved.



"That the proposed NY Sea Grant Institute be recognized as a creature of the State University and Cornell and that the Institute would be that element of the two Institutions which would receive the designation of National Sea Grant College status for and in behalf of the two institutions; that the administration of that institute would be, to a large extent, in the hands of the Governing Board, that Board to be appointed from senior administrative officials and faculty of the two institutions, and from agencies of the state as appropriate, and in equal numbers by [the] President [of Cornell]...and [the] Chancellor [of State University]...; that the Board function to establish the policy for the institute, that the Board recruit, possibly select, and certainly recommend appointment of the Director, subject to approval by the Trustees of State University or Cornell respectively, and that the Board approve the programmatic directions in the annual program...Advisory groups are to be appointed by the Governing Board upon the recommendation of the Director."

November 25, 1975

The Board revises its previous policies regarding research particularly regarding the role of the Institute in developing research at the University Colleges. The new policy adopted is:

"The primary criteria for selection of projects should be the quality of the research activity; its relation to the objectives and to the plan of the development of the Institute; and effective utilization of the resources of the institutions of New York State."

The Board also takes cognizance of the difficulties of inter-disciplinary, multi-institutional research coordination and expresses the future potential of strong research clusters, possibly subject focussed, developed on the various campuses.

March 19, 1975

The Board approves the title Associate Director for Communications.

December 3, 1976

"After full consideration of the problems the Institute [has] experienced in gaining academic priorities for hiring of faculty in certain marine disciplines, the Board moves the concept of Sea Grant supporting a faculty position for no more than three years if the host campus committed itself to absorbing that position in its faculty." Two such appointments were authorized: One was to be in shellfish biology; the second in marine management economics. [The term "Sea Grant professorship" was later coined by Dr. J.R. Schubel, director, Marine Sciences Research Center, SUNY at Stony Brook, in his application for such an appointment. The term was swiftly adopted by staff and Board.]

February 10, 1977

The Board approved the title Assistant Director for Management within the Institute.



May 23, 1978

The first Sea Grant Professorship is awarded: Shellfish Biology, SUNY at Stony Brook. Proposals for the Marine Management Economics Professorship are rejected.

Institute participation in an effort to establish a seafood laboratory on Long Island is approved. [This became the NYS Seafood Technology Laboratory]

The Great South Bay Study Plan is approved as an element of the Institute's program for which state support is to be sought.

A review of the performance of the director of the Institute is to be initiated as required under university guidelines.

May 15, 1979

"Recognizing that National Sea Grant is emphasizing youth education, the Board considered the role of the Sea Grant Institute in New York. A position is adopted that youth education should be pursued, but with care and thought and that an emphasis on minority education be given."

The Board sent a delegation to visit Office of Sea Grant leadership to review the status and performance of the New York program.

May 21, 1980

The Board recommends to President Rhodes and Chancellor Wharton that D.F. Squires be re-appointed as director of the Institute.

Establishment of the third Sea Grant professorship in Lake Ontario sportfishery biology is approved. [By mail, a fourth professorship, in marine phycology, established as a part of the Marine Biomass Project, was also approved.]

The Institute is permitted to allow faculty to recover up to 2 1/2 months summer salary where appropriate and permitted by campus policy.

"Except in defined circumstances, research proposals submitted by graduate students independently of their advisors will not be accepted by the Institute."

A policy on sabbatical leaves is adopted: The final policy [as revised] states:

"1. The Sea Grant Institute will not, except in unusual circumstances, provide research support for activities conducted while a principal investigator is on leave from his or her campus.

2. Leave without prior written agreement with the Institute is adequate basis for immediate termination of support.

3. Continuation of support for Sea Grant Scholars supervised by a faculty member on leave can be arranged if prior written agreement has been reached on how this will be undertaken.



"In view of the lack of agreement between counsel for The Research Foundation of State University, Cornell University and the State University of New York regarding the draft contract setting forth the terms of the relationships among parties, as expressed in the plan for the Sea Grant Institute, the Board of Governors directs the director to cease pursuit of that goal. The Board is determined that it will assume the role defined for it in the Plan for the Sea Grant Institute and carry out those functions. In recognition of the coincident 10th anniversary of Sea Grant in New York, the Board commemorates that event and presents its understanding of the relationship of the Board of Governors of the Sea Grant Institute to Cornell University and State University of New York in letters to Chancellor Wharton and President Rhoades."

May 13, 1981

The Board instructs the director to draw up plans for the orderly termination of the New York Sea Grant program and for proper termination of staff and functions of the Sea Grant Institute, and alternatives thereto, should federal funding be terminated.

The Board accepts the director's recommendation that the formal Advisory Council be disbanded, but instructs that alternative means of seeking external guidance be developed.

Host campuses for the third and fourth Sea Grant professorships are designated.

May 12, 1982

A cost-recovery policy for Sea Grant Extension prepared by Extension staff is adopted.

Establishment of a fifth Sea Grant professorship, in Aquacultural Engineering [subsequently altered to Marine Trades Engineering], is approved, funds permitting.

Approval is given to the concept of developing a Great Lakes Sportfishery Center with funding from the private sector.

May 10, 1983

The Board approves the creation of a second position titled "Assistant Director for Program" providing that the costs fell within the management ceiling given by the Board [10% of all funds].



# RESTAURANT GUIDE - 411 STATE STREET AREA



1. Lauren's Deli - 187 Lark
2. La Cantina - 215 Lark
3. The Larkin - 199 Lark
4. The Beverwyck - 275 Lark
5. Justin McNeils- 301 Lark
6. Unlimited Feast-340 Hamilton
7. Bella Pizza - 32 Central
8. Cafe Nia - 193 Lark
9. Ozzies - 423 Madison (corner Lark)



Research Foundation (Rockefeller  
411 State Street Institute)



Rockefeller  
Institute  
411 State St.

# EMPIRE STATE PLAZA AND ENVIRONS

NY Soc. Grant Institute  
37 Elk St.

Twenty-one Club

Hilton  
Hotel

1. State Capitol
2. State Education Building
3. Governor A. E. Smith Building
4. Legislative Office Building
5. Justice Building
6. Swan Street Building
7. Agency Building 1
8. Agency Building 2
9. Agency Building 3
10. Agency Building 4
11. Tower Building
12. Cultural Education Center
13. Meeting Center
14. Executive Mansion
15. Court of Appeals

## DINING GUIDE - SOME SUGGESTIONS

- |                                 |                          |
|---------------------------------|--------------------------|
| A - Barnaby's                   | - Corner State & Eagle   |
| B - Ogdens                      | - 42 Howard Street       |
| C - Bella Napoli                | - 97 Beaver Street       |
| D - La Serre Restaurant         | - 14 Green Street        |
| E - Jack's Oyster House         | - 42 State Street        |
| F - Gaspary's Quackenbush House | - Quackenbush & Broadway |
| G - The Beverwyck               | - 275 Lark Street        |
| H - Twenty-One Club             | - 21 Elk Street          |
| I - L'Auberge                   | - 351 Broadway           |

DEVELOPMENT STAGES IN NEW YORK'S

LAKE ONTARIO SALMONID PROGRAM

1968-1971	Coho and chinook salmon stocked in Lake Ontario; poor survival observed due to sea lamprey parasitism
1972	Lamprey treatment initiated
1972	State formulates major development/rehabilitation program for salmonid hatchery system
1973-1976	Brown, rainbow and lake trout stocking added; improved survival and catches of salmonids; first major economic impact documented; beginning of major fishing derby; first charter licenses sought
1976-1977	Detection of toxic chemical (PCB's, mirex, dioxin) traces; state-imposes possession ban on salmonids & moratorium on stocking Pacific salmon species
1978	Improvement in toxic chemical levels documented; state lifts possession ban
1979	Changes in conservation department leadership and policy leads to lifting of Pacific salmon stocking moratorium
1981	Completion of new Salmon River Hatchery and rehabilitation of older facilities continues; stocking levels begin to increase toward management goals
1981-Present	Explosive growth in fishing - related industry; number of charter operators jumps from 35 to 300; fishing business investment/development visible along entire lakeshore.
1989	Maturation of salmonid fishery expected by state



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# HISTORY

## Sea Grant in New York

**The Concept:** The State University of New York and Cornell University first considered a collaborative Sea Grant Program in the summer of 1967 in discussions between W.K. Kennedy, Vice Provost of Cornell and H.C. Syrett, Vice Chancellor of State University of New York. These institutions offered different, but complementary, capabilities for implementing the Sea Grant concept in New York: State University of New York, a system of over 65 campuses, sought to develop lead "university-wide centers" in certain subject areas, one of which was aquatic sciences and provided statewide access to the two coastal regions of the state; Cornell as the land grant college had established capabilities in extension and in applied research of the sort which would be required by Sea Grant.

An initial approach by Cornell to the Office of Sea Grant was not received enthusiastically because of Ithaca's "remoteness from the coastal region" (R. Wildman, Pers. Comm). In November, 1967, Robert Abel, then director of the National Sea Grant Program, wrote to Vice Provost Kennedy accepting the concept of a consortial proposal--warning that such an arrangement would pose problems later when Sea Grant College status was sought.

**Planning Grant:** The consortial approach to Sea Grant was consolidated when Vice Provost W. Keith Kennedy, Cornell, and Academic Vice President H. Bentley Glass, SUNY at Stony Brook, agreed in principle on the desirability of a collaborative program. The director of the then developing SUNY university-wide Marine Sciences Research Center at Stony Brook, D.F. Squires, was asked to take the lead in developing an inter-institutional, multiple-campus Sea Grant program for New York. A planning grant was submitted on November 7, 1969 and awarded in the amount of \$18,696.

**Institutional Support:** The first proposal for institutional funding was submitted to the Washington Office of Sea Grant in April, 1970, and first year funding was awarded in October, 1971. Figures H1-H3 and Tables H1-H2 illustrate, and provide detail on, the funding history of institutional grants.

**Forming the Sea Grant Institute:** In September, 1974, in anticipation of designation as a Sea Grant College, State University of New York and Cornell University announced their intention to implement the plan for the establishment of the "New York State Sea Grant Institute" [The word "state" was subsequently deleted because of the implication that the Institute was an agency of the state]. That plan, developed by a committee of the Governing Board, and recommended by it to the Chancellor of State University and the President of Cornell, had been completed May 23, 1974. The objectives of the Institute as cited in that plan were:

"1. To expand human knowledge of the marine environment and to accelerate the development of marine resources through programmed interdisciplinary research;

"2. To promote education and training in marine science, especially in newly evolving and cross-departmental specialties and in subjects relevant to coastal residents;

"3. To serve as a coordinative liaison for all segments of the



## History: Sea Grant in New York

coastal community, working with them to disseminate the results of research and the availability of governmental services, and to feed back their needs into the research network."

The Sea Grant Institute was to be the instrument for the administration of the state's Sea Grant program and "...the Institute will be the entity designated as Sea Grant College." The Institute was seen as consisting of a central unit with a network of interconnections with campuses of State University, the statutory and endowed colleges at Cornell, and "other private colleges and organizations, public agencies and industries." Entities to be constructed were: the Governing Board; the Institute Staff; and Advisory Councils. Each of these will be developed in following sections. The New York Sea Grant Institute was the first multiple-campus institutional Sea Grant program and New York was the first Sea Grant state to adopt a management entity bearing the words Sea Grant in its title.

In June of 1974, in identically worded resolutions, the Board of Trustees of the State University of New York and the Executive Committee of the Board of Trustees of Cornell University authorized implementation of the Plan for the Sea Grant Institute.

"Resolved that the establishment of the New York State Sea Grant Institute be, and hereby is, approved; and, be it further

"Resolved that the [Chancellor][President] be, and hereby is, authorized, in cooperation with the [President of Cornell University][Chancellor of State University of New York], to take all necessary and proper steps to implement the plan for the New York State Sea Grant Institute."

Executive Vice Chancellor James Kelly and Provost Robert Plane (State University and Cornell, respectively) announced the formation of the Institute at the annual site visit dinner, held that year at Cornell University.

**Sea Grant College Designation:** In January, 1975, Secretary Frederick B. Dent, US Department of Commerce, and Administrator Robert White, National Oceanic and Atmospheric Administration announced that State University of New York and Cornell University had been designated a Sea Grant College. The designation was celebrated by sequential dinner events held at Stony Brook and in Ithaca.

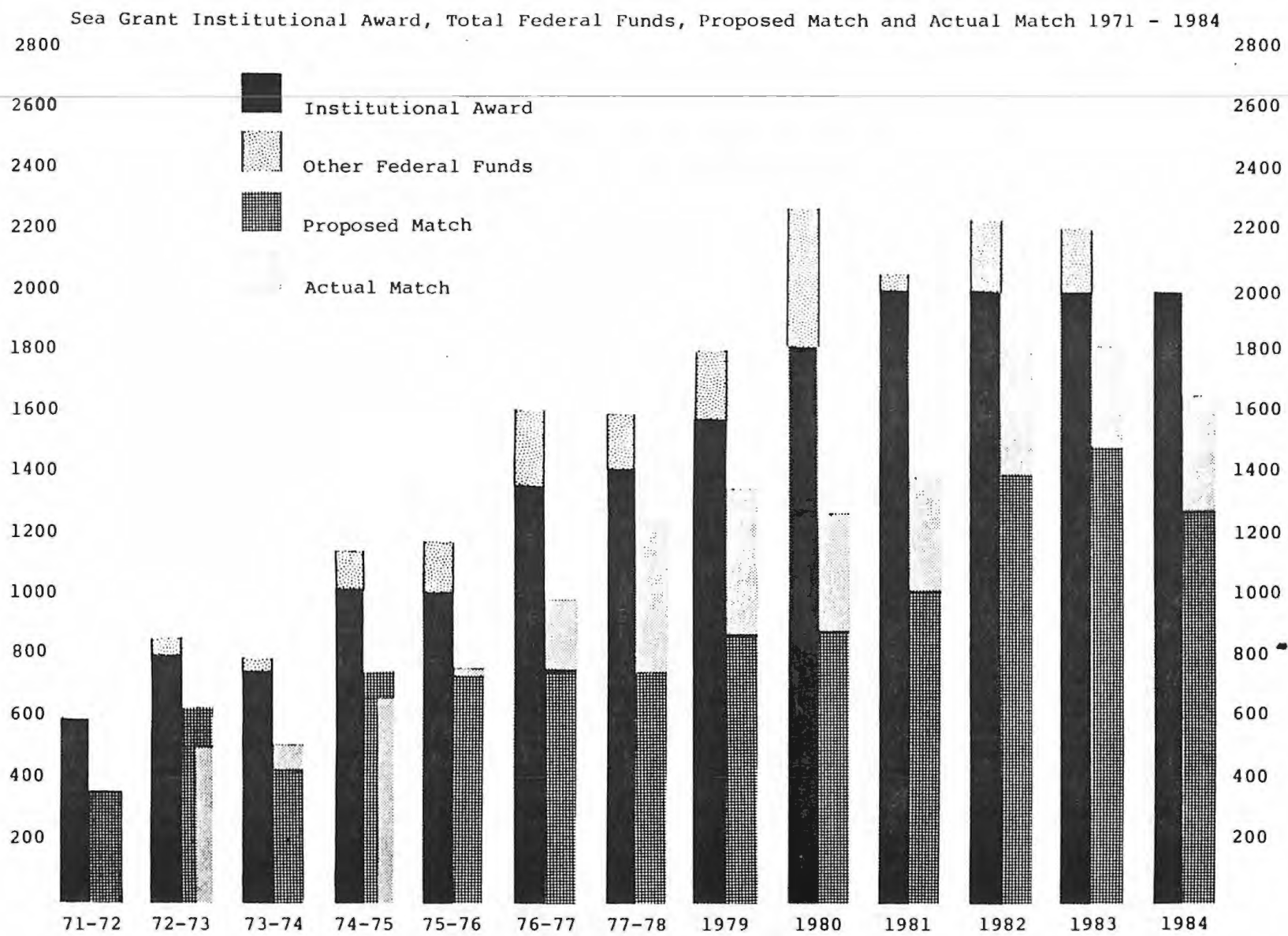


Figure H1. Institutional Funding



# History: Sea Grant in New York

Table H1. Federal Funding of New York Sea Grant Activities

Year	Institutional Awards	Other Federal Supplements and Pass Through Awards	MESA Awards	Total Federal Awards
1969-70 (planning)	18,700	-0-	-0-	18,700
1971-72	600,000	-0-	-0-	600,000
1972-73	800,000	57,560	-0-	857,560
1973-74	750,000	48,100	-0-	798,100
1974-75	1,016,300	126,900	-0-	1,143,200
1975-76	1,050,000	52,700	79,400	1,182,100
1976-77	1,373,500 (1)	122,600	114,100	1,610,200
1978	1,410,000	113,670 (2)	75,000	1,598,670
1979	1,580,000	104,700	117,800	1,802,500
1980	1,830,000	391,046 (3)	45,000	2,266,046
1981	2,001,000	33,805 (3)	22,000	2,056,805
1982	2,000,000	231,500	4,500	2,236,000
1983	2,000,000	129,700	-0-	2,129,700
1984 (4)	<u>2,025,100</u>	<u>-0-</u>	<u>-0-</u>	<u>2,025,100</u>
TOTALS	18,454,600	1,412,281	457,800	20,324,681

(1) Includes 2 month supplement award of \$156,000 to shift grant start date from Nov. to Jan.

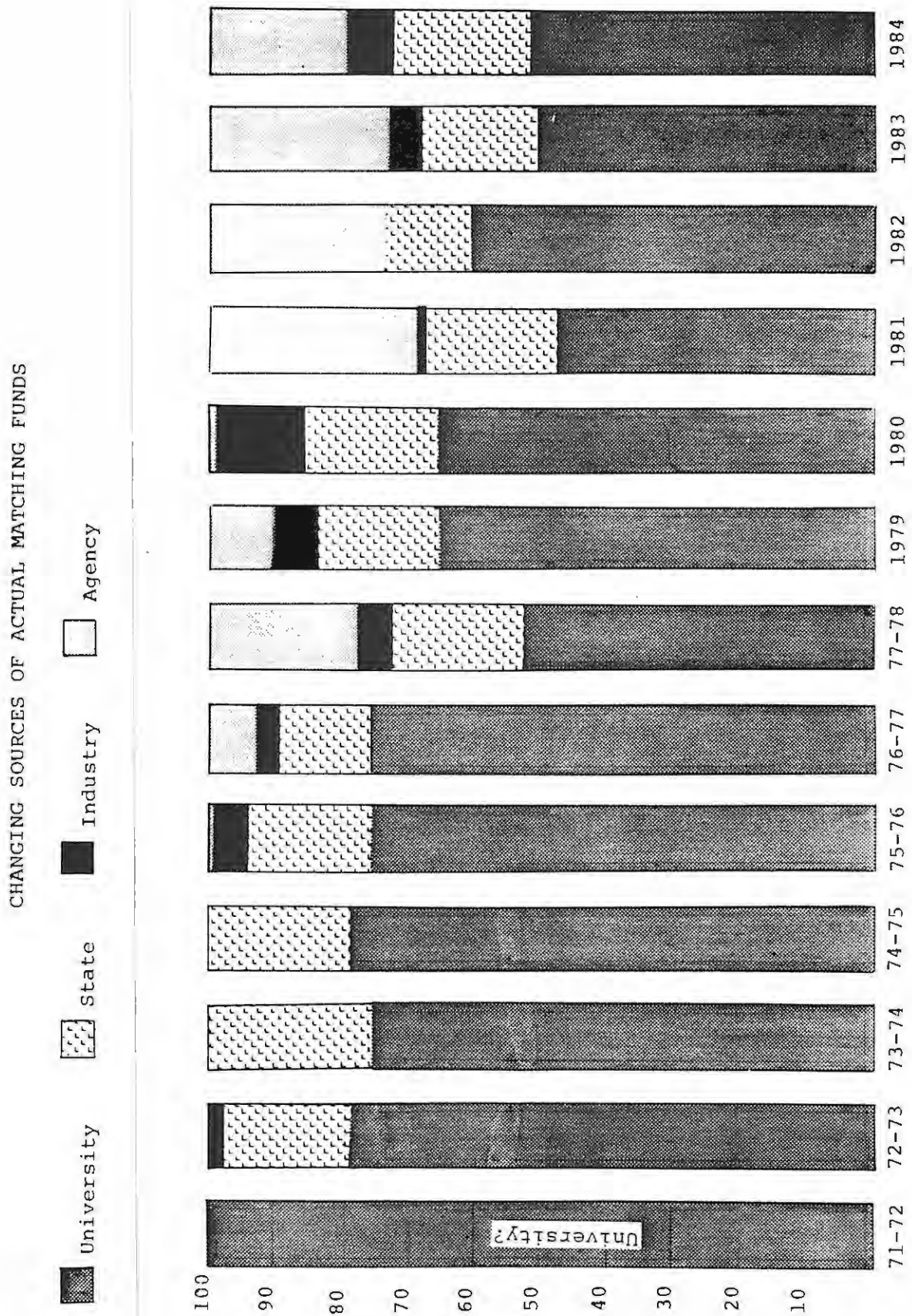
(2) Includes \$15,000 - fixed price award for conference

(3) Includes contract with Maryland Sea Grant \$5,646 in 1980 and \$9,200 in 1981

(4) Reflects only portion of year

Data inclusive of June 1984.

Figure H2. Match Funds Source





History: Sea Grant in New York

Table H2. Proposed and Actual Matching Funds - New York Sea Grant

**Matching Funds - 1971-1972**

(Institutional Award - \$600,000)

Proposed \$378,563  
Ratio 63.1%

Actual (unknown)  
Ratio (unknown)

**Sources:**

University  
State Appropriation  
Non-University  
Agency  
Industry

Amount                      % of Total Match

-0-  
-0-  
-0-  
-0-

**Matching Funds - 1972-1973**

(Institutional Award - \$800,000)

Proposed \$628,502  
Ratio 78.5%

Actual \$500,000  
Ratio 62.5%

**Sources:**

University  
State Appropriation  
Non-University  
Agency  
Industry  
    WNBC (Radio Air Time)  
    Various Radio Stations  
    Various Donors - TV Equipment

Amount                      % of Total Match

\$389,700                      77.9%  
100,000                      20.0%  
10,300                      2.1%  
-0-  
10,300  
    4,400  
    4,400  
    1,500

**Matching Funds - 1973-1974**

(Institutional Award - \$750,000)

Proposed \$418,253  
Ratio 55.7%

Actual \$506,205  
Ratio 67.5%

**Sources:**

University  
State Appropriation  
Non-University  
Agency  
Industry

Amount                      % of Total Match

\$381,205                      75.3%  
125,000                      24.7%  
-0-  
-0-  
-0-

Table H2. continued

**Matching Funds - 1974-1975**

(Institutional Award - \$1,016,300)

Proposed \$728,802  
Ratio 71.7%

Actual \$667,984  
Ratio 65.7%

Sources:	Amount	% of Total Match
University	\$517,984	77.5%
State Appropriation	150,000	22.5%
Non-University	-0-	
Agency	-0-	
Industry	-0-	

**Matching Funds - 1975-1976**

(Institutional Award - \$1,050,000)

Proposed \$763,182  
Ratio 72.7%

Actual \$735,045  
Ratio 70.0%

Sources:	Amount	% of Total Match
University	\$550,595	74.9%
State Appropriation	129,500	17.6%
Non-University	54,950	7.5%
Agency	1,450	
Department of Environmental Conservation	1,375	
New York Conservation Council	75	
Industry*	53,500	
Chase Manhattan	3,500	
Rockefeller Foundation	45,000	
Construction Aggregates, Inc.	5,000	

\* Added here--doubtfully included in final financial report (actual reported \$681,545)

**Matching Funds - 1976-1977**

(Institutional Award - \$1,373,500)

Proposed \$727,951  
Ratio 52.9%

Actual \$988,137  
Ratio 71.9%

Sources:	Amount	% of Total Match
University	\$744,366	75.3%
State Appropriation	134,500	13.6%
Non-University	109,271	11.1%
Agency	75,271	
Office of General Services	50,000	
New York City Board of Education	25,271	
Industry	34,000	
WNBC (Radio Air Time)	34,000	



History: Sea Grant in New York

Table H2. continued

Matching Funds - 1977-1978

(Institutional Award - \$1,410,000)

Proposed \$741,000  
Ratio 52.6%

Actual \$1,226,594  
Ratio 86.9%

Sources:

	Amount	% of Total Match
University	\$642,554	52.4%
State Appropriation	234,800	19.1%
Non-University	349,240	28.5%
Agency	288,240	
New York City Board of Education	14,000	
County Extension Associations	15,000	
Office of General Services	50,000	
Dept. of Environmental Conservation	74,840	
Job Development Authority	1,400	
Job Development Authority	55,000	
Energy Research and Development Authority	55,000	
Canadian Centre for Inland Waters	23,000	
Industry	50,000	
Monsanto	5,000	
Sea Land Service	5,000	
Jack Prince, Inc.	40,000	
Foundations	11,000	
Stony Brook Foundation	8,000	
Link Foundation	3,000	

Matching Funds - 1979

(Institutional Award - \$1,580,000)

Proposed \$865,221  
Ratio 54.8%

Actual \$1,356,765  
Ratio 85.9%

Sources:

	Amount	% of Total Match
University	\$877,340	64.7%
State Appropriation	248,000	18.3%
Non-University	231,425	17.0%
Agency	128,825	
Department of Environmental Conservation	55,000	
Office of General Services	40,825	
New York Board of Education	14,000	
County Extension Associations	19,000	
Industry	97,600	
Beehive Corp.	40,000	
National Fisheries Institute	3,000	
Shelter Island Oyster Co.	50,000	
Dunn Geo-Science, Inc.	1,600	
Miscellaneous Fishery Businesses	3,000	
Foundations	5,000	
Dreyfus	5,000	

Table H2. continued

**Matching Funds - 1980**

(Institutional Award - \$1,830,000)

Proposed \$893,326  
Ratio 48.8%

Actual \$1,273,636  
Ratio 69.6%

**Sources:**

	Amount	% of Total Match
University	\$827,267	65.0%
State Appropriation	255,000	20.0%
Non-University	191,369	15.0%
Agency	19,000	
County Extension Associations	19,000	
Industry	172,369	
General Electric Co.	119,219	
Rand Corp.	3,500	
Gem City Marine	1,800	
Lord Corp.	13,300	
Steers/Buckley/Gates/Spearin	15,800	
Long Island Railroad	8,500	
US Steel	9,750	
Goodyear Corp.	500	

**Matching Funds - 1981**

(Institutional Award - \$2,001,000)

Proposed \$1,090,257  
Ratio 54.5%

Actual \$1,398,046  
Ratio 69.9%

**Sources:**

	Amount	% of Total Match
University	\$660,146	47.2%
State Appropriation	280,000	20.0%
Non-University	457,900	37.8%
Agency	455,900	
Energy and Research Development Authority	170,000	
Gas Research Institute	170,000	
Port Authority of NY and NJ	62,000	
Suffolk County	2,500	
County Extension Associations	51,400	
Industry	2,000	
Other	2,000	
Includes: Long Island Oyster Farms		
Frank M. Flowers, Inc.		
Fire Island Fisheries		
Cleveland Technical Corp.		
Long Island Shellfishermen's Assoc.		

# History: Sea Grant in New York

Table H2. continued

## Matching Funds - 1982

(Institutional Award - \$2,000,000)

Proposed \$1,406,679  
Ratio 70.3%

Actual \$2,232,665  
Ratio 111.6%

Sources:	Amount	% of Total Match
University	\$1,340,421	60.0%
State Appropriation	290,000	13.0%
Non-University	602,244	27.0%
Agency	602,244	
Energy and Res.& Dev. Authority	200,000	
New York Gas Group	50,000	
Gas Research Institute	329,274	
Suffolk County	28,000	
Industry	-0-	

## Matching Funds - 1983

(Institutional Award - \$2,000,000)

Proposed \$1,494,564  
Ratio 74.7%

Estimated \$1,823,000  
Ratio 91.2%

Sources:	Amount	% of Total Match
University	\$913,600	50.1%
State Appropriation	320,900	17.6%
Non-University	588,500	32.3%
Agency	494,500	
Energy and Res.& Dev. Authority	200,000	
Gas Research Institute	294,500	
Industry	94,000	
E/V <u>Ontario</u> Donations	19,000	
Shinnecock Tribal Oyster Project	25,000	
Brooklyn Union Gas, Inc.	50,000	

## Matching Funds - 1984

(Institutional Award - \$2,000,000)

Proposed \$1,269,400  
Ratio 63.5%

Estimated \$1,663,940  
Ratio 83.2%

Sources:	Amount	% of Total Match
University	\$850,000	51.1%
State Appropriation	330,900	19.9%
Non-University	483,040	29.0%
Agency	367,790	
Energy and Res.& Dev. Authority	56,240	
Gas Research Institute	253,300	
Town of Babylon	4,600	
Suffolk County Health Services	53,650	
Industry	115,250	
Shinnecock Tribal Oyster Project	40,000	
E/V <u>Ontario</u> Donations	22,000	
Mid-Atlantic Fishery Foundation	3,250	
Brooklyn Union Gas, Inc.	50,000	



## Relationship of Proposed Match to Actual Match

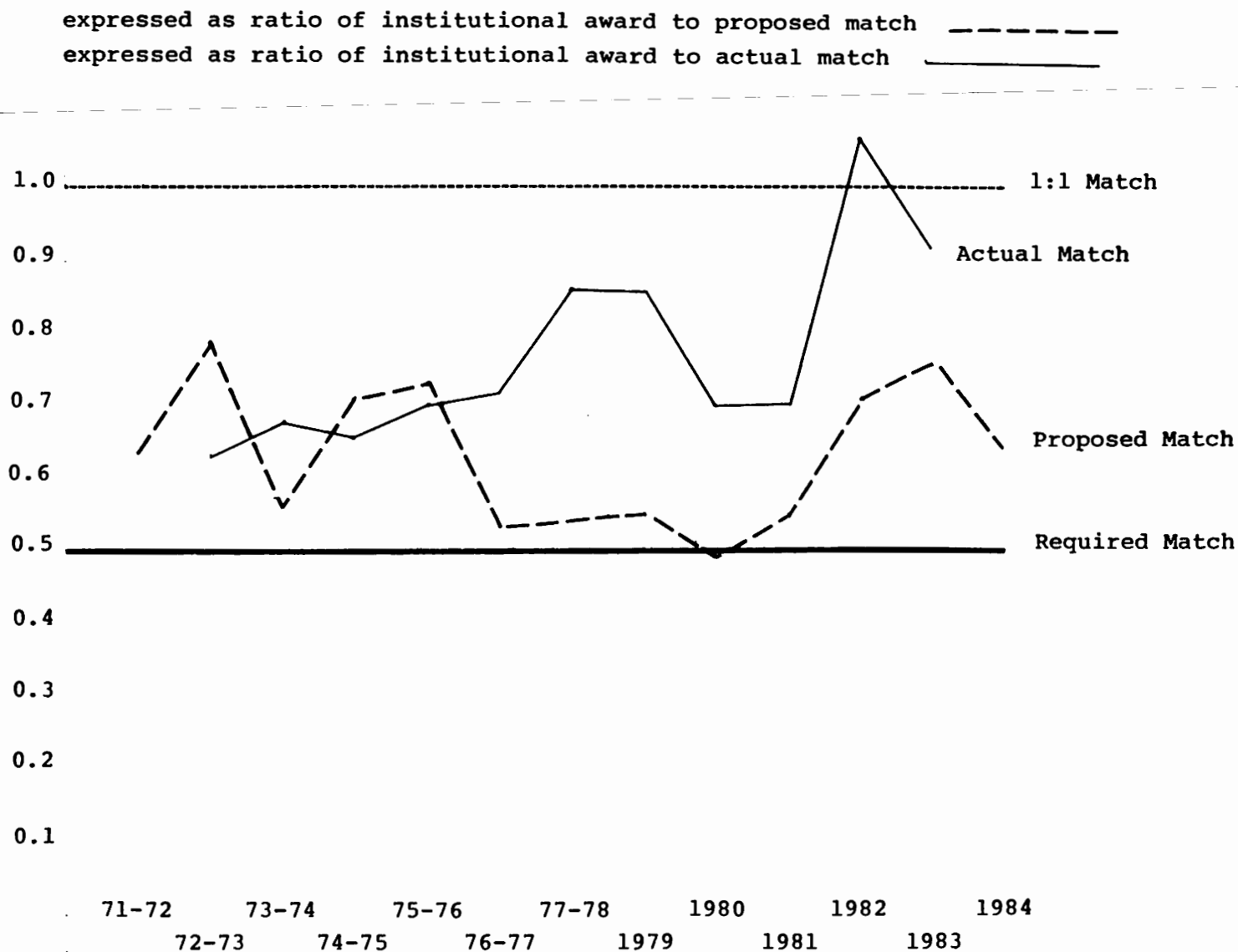


Figure H3. Match as a Proportion of Required Funding

History: Sea Grant in New York

New York Sea Grant - Grant History - 1971-June 1984

NOAA Grant No. unknown

1971-72 Period of award

Beginning date  
Oct. 71

	1971-72	TOTAL
Institutional Award	\$600,000	\$600,000

NOAA Grant No. 04-3-158-39

1972-77 Period of award

Beginning date  
Oct. 72

	1972-73	1974	1975	TOTAL
Institutional Award	\$800,000	\$750,000	\$-0-	
Other Federal Awards	(1) 125,000 (2) <u>32,560</u> \$957,560	(1) 44,000 (2) <u>4,100</u> \$798,100	(1) 83,900 <u>83,900</u>	\$1,839,560

- (1) Production of Preliminary New York Bight Atlas (NOAA/MESA)  
(2) New York Bight Eco-System Research (NOAA/MESA)

NOAA Grant No. 04-5-158-34

1974-77 Period of award

Beginning date  
Nov. 74

	1974-75	TOTAL
Institutional Award	\$1,016,300	
Other Federal Awards	(1) 36,900 (2) <u>6,100</u> \$1,059,300	\$1,059,300

- (1) The Middle Atlantic Continental Shelf and New York Bight Conference (NOAA/MESA)  
(2) MESA New York Bight Atlas Monographs (NOAA/MESA)



NOAA Grant No. 04-6-158-44040

1975-77 Period of award

Beginning date  
Nov. 75

	1975	1976	TOTAL
Institutional Award	\$1,050,000		
Other Federal Awards		(1) \$47,500	
		(2) <u>5,200</u>	
	<u>\$1,050,000</u>	\$52,700	\$1,102,700

- (1) MESA New York Bight Atlas Monograph Series (NOAA/MESA)  
(2) Public Participation Assistance for the Pennsylvania Coastal Zone Management Program (NOAA/CZS)

NOAA Grant No. 04-7-158-44009

1976-80 Period of award

Beginning Date  
Nov. 76

	1976	1977	1978	TOTAL
Institutional Award	\$1,217,500	\$156,000	\$1,410,000	
		(2 mo.)		
Other Federal Awards		(1) 59,800	(4) 26,670	
		(2) 32,600	(5) 15,000*	
		(3) <u>30,200</u>	(6) <u>72,000*</u>	
	<u>\$1,217,500</u>	\$278,600	\$1,436,670	\$2,932,770

- (1) AQUAVET - Aquatic Veterinary Medicine (NOAA/NSGCP)  
(2) Advisory Efforts on Extended Jurisdiction (NOAA/NSGCP)  
(3) A Coherent Project in K-12 Marine Youth Education and "Please Go Near the Water" (NOAA/NSGCP)  
(4) Extension of Support for a Coherent Project in K-12 Marine Youth Education (NOAA/NSGCP)  
(5) Fixed Price Award for Conference (NOAA/OMPA)\*  
(6) International Project (NOAA/NSGCP)\*

\* Not included in Sea Grant award



NOAA Grant No. NA79-AAD-00053

1979-82 Period of award

Beginning date  
Jan. 79

	1979	1980	TOTAL
Institutional Award	\$1,580,000	\$1,830,000	
Other Federal Awards	(1) 76,700 (2) 2,000 (3) 20,000 (4) <u>6,000</u>	(5)a. 145,700 b. 232,900 (6) 6,800 (7) <u>5,646*</u>	
	\$1,684,700	\$2,215,400	\$3,900,100

- (1) The Aggregate Income and Product of the Ocean - Phase II (NOAA/NSGCP)  
 (2) Lake Erie Recreation Climate Brochure (NOAA/EDS)  
 (3) Marine Youth Education Program (Ecology Village Gateway) (DOI/NPS)  
 (4) New York Participation in Great Lakes Sea Grant Network (NOAA/NSGCP)  
 (5) a.&b. Containment of Dredged Sediment under the Floor of the Lower Bay of New York Harbor (DOD/COE)  
 (6) Instant Daphnia Bioassay (EPA)  
 (7) An Economic Evaluation of the Atlantic Coast Striped Bass Fishery - Contract Maryland Sea Grant\*

\* Not included in Sea Grant award

NOAA Grant No. NA81-AAD-00027

1981-84 Period of award

Beginning date  
Jan. 81

	1981	1982	1983	1984
Institutional Award	\$2,001,000	\$2,000,000	\$2,000,000	\$2,025,100
Other Federal Awards	(1) 17,105 (2) 3,500 (3) 4,000 (4) <u>9,200*</u>	(1) 17,100 (5) 214,400	(5) 129,700	
	\$2,025,605	\$2,231,500	\$2,129,700	\$2,025,100

TOTAL \$8,411,905

- (1) Recreational Fishing in New York City (NOAA/MESA)  
 (2) Advisory Service "Lake Ontario Recreation Climate" (NOAA/EDS)  
 (3) Advisory Service Brochure "Eastern Long Island Recreation Climate" (NOAA/EDS)  
 (4) An Economic Evaluation of the Atlantic Coast Striped Bass Fishery - Contract Maryland Sea Grant\*  
 (5) Submarine Burial of Dredged Sediment in New York Harbor (DOD/COE)

\* Not included in Sea Grant award

### The Governing Board

**Origins of the Board:** Since its inception, the New York Sea Grant program has had a controlling body called the Governing Board. As originally formed in 1970, it served as an advisory committee to the Chancellor of State University. The Board had a membership of nine appointed by the Chancellor and reporting through the Provost of the State University system (see Table H3).

**Responsibilities of the Board:** At a site visit dinner in September 1974, Executive Vice Chancellor James Kelly announced on behalf of State University and Cornell the formation of the Sea Grant Institute. The plan for the Sea Grant Institute stated:

"The first element in the Institute will be the Governing Board. Its members will be senior administrative officials from the two institutions and from appropriate state agencies, chosen equally by the Chancellor of State University of New York and the President of Cornell University. The Board's functions will include establishing policies, selecting Institute officers, approving programmatic emphases and directions, and approving annual program content."

**The Present Board:** In 1975, the Board was restructured to consist of:

Appointed by the President of Cornell University:

Five senior administrative officials

One lay member

Appointed by the Chancellor of State University:

Five senior administrative officials

One lay member

Ex Officio:

The Commissioner, New York State Department of Environmental  
Conservation

The Commissioner, New York State Department of Commerce

The Director, The Sea Grant Institute

The Governing Board has met regularly, at least once each year, since its beginning. Present membership is listed in Table H4.

The following blue pages present a selection of policies adopted by the Board which have affected the course of the Institute and which are relevant in the following discussion.



## History: The Governing Board

Table H3. The First Sea Grant Governing Board

A.M. Ammerman, President, Suffolk County Community College  
L.T. Benezet, President, State University at Albany  
A.W. Brown, President, State University at Brockport  
E.K. Fretwell, Jr., President, State University at Buffalo  
H.B. Glass, Academic Vice President, State University at Stony Brook  
S.S. Gordon, Vice President for Academic Affairs, State University at  
Binghamton  
M.W. Ertell, Vice Chancellor for University-wide Activities, State  
University  
L.C. Carter, Vice President for Social and Environmental Studies, Cornell  
University  
W.K. Kennedy, Vice Provost, Cornell University

Table H4. Present Membership, Board of Governors, New York Sea Grant Institute

Chairman - Edward C. Melby, Dean, NYS College of Veterinary Medicine,  
Cornell University  
Vice Chairman - Thomas Dyer, Attorney at Law, Marcellus, NY  
D. Behrend, Vice President for Program Affairs, College of Environmental  
Science and Forestry  
D. Call, Dean, NYS College of Agriculture and Life Sciences, Cornell  
University  
T. Headrick, Dean, School of Law and Jurisprudence, SUNY at Buffalo  
H. Neal, Provost, State University of New York at Stony Brook  
L. Noble, Director, Cooperative Extension, Cornell University  
D. O'Dowd, Executive Vice Chancellor, State University of New York  
R. Oglesby, Chairman, Natural Resources, Cornell University  
N. Orloff, Director, Water Resources Research Institute, Cornell  
University  
V. Radley, President, State University College at Oswego  
D.G. Witscheiben, Haworth, N.J.

ex officio:

Commissioner of the NYS Department of Environmental Conservation  
Commissioner of the NYS Department of Commerce  
Director, New York Sea Grant Institute

### Allocation of Funds to Activities

Following funding of the first year of Sea Grant activities, it became clear that some mechanism was required to "protect" extension funding from the avarice of researchers. Many researchers disputed the proportion of Sea Grant funds provided to Advisory Service in the first year program (25%): A statement frequently made was that the money would be better spent upon research. The "protection" strategy: The Board of Governors would determine the proportion of funding for the various activities (research, education, training and advisory service) as a part of their review of the program proposal. At the same time, the allocation sets a cap on expenditures--important as salaries increase. Extension and program management are the two activities of Sea Grant which principally involve personnel budgets.

In 1970 the ad hoc Advisory Committee (precursor to the Governing Board) confirmed the Director's recommendation that Advisory Service should be funded at approximately 25% of the federal request. This phraseology was later modified to reflect a portion of "total program funds" accounting for state appropriated money as well as the federal institutional award. At this same time the Board also set a ceiling on program management funds at 10% of total funding.

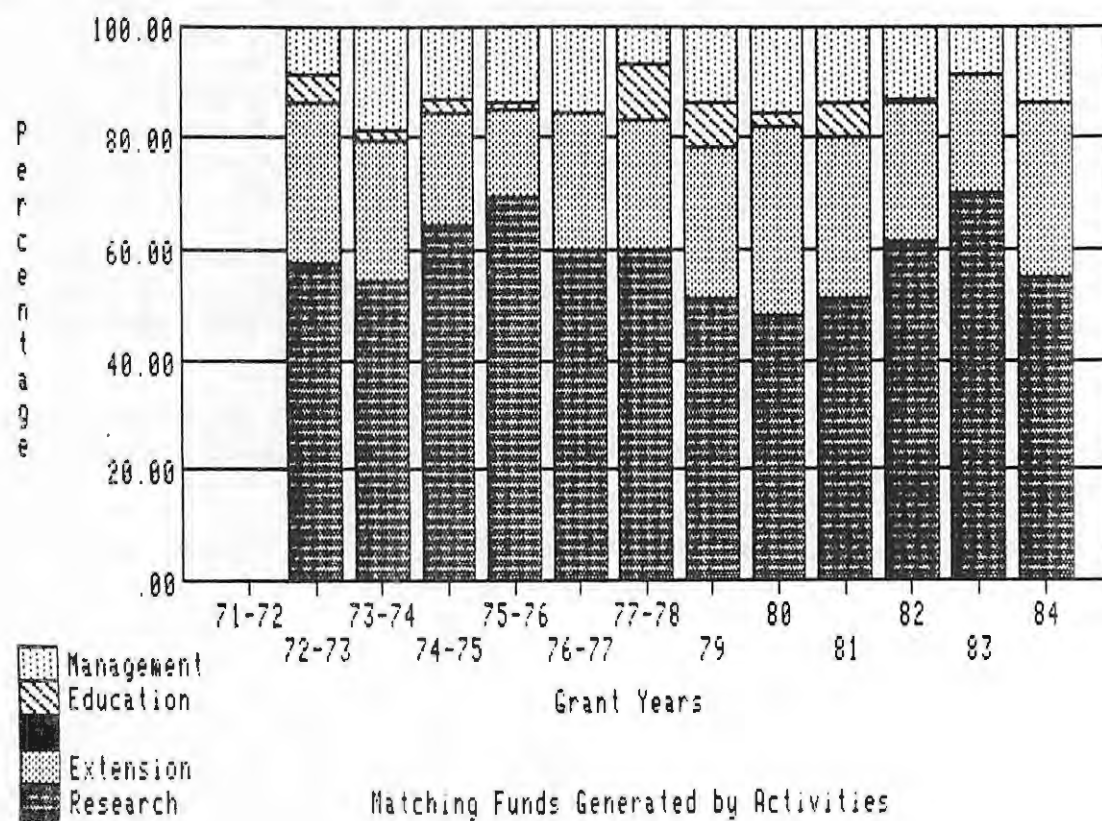
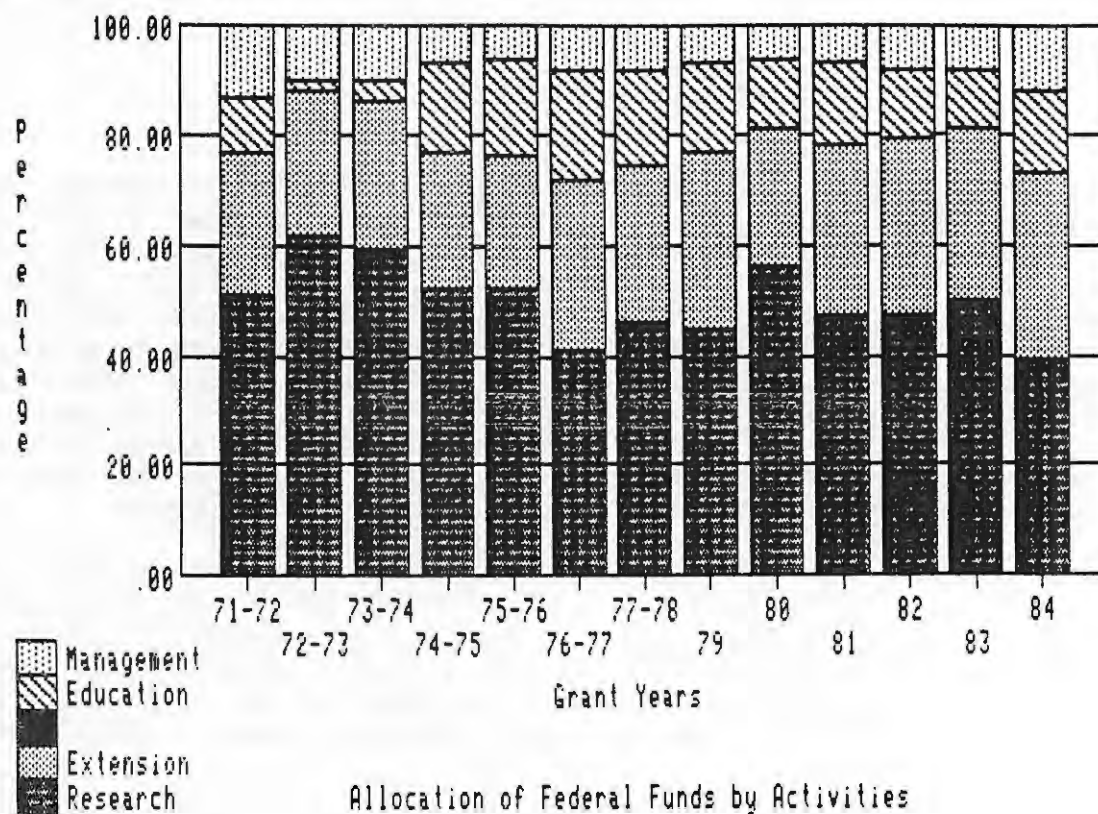
By 1972 the Governing Board had approved the current maximum level of funding for advisory service at 33 1/3% of total funding. The ceiling for program management has remained at 10%. Allocations for education and training were not so easily made, however. Because graduate students comprise a most significant part of both the education and research activities, and because the Board has felt that support of graduate students was a primary role for Sea Grant, no limitations were imposed. As K-12 education became an important activity within the Sea Grant community, the Board of Governors reviewed the Institute's role and expressed caution, but also did not define a ceiling.

The process of allocating funds to activities has proved to be beneficial. The arbitrary process provided a needed buffer between competing uses for funds and allowed Sea Grant Extension to project a future growth dependent only upon the increases in the Institutional Award.

Fund allocations pertain only to Institutional Sea Grant funds and to State appropriations for Sea Grant. Contracts and grants for special purposes are not included.

Figure H4 illustrates sample funding allocations over the 13 year period.

Figure H4. Funding Allocations





# **THE INSTITUTE**

## **The New York Sea Grant Institute**

### **Development of a Management Group**

**Pre-Institute Sea Grant Management:** Before formation of the Sea Grant Institute, a general management and development system evolved to initiate and evaluate program activities. Sea Grant activities were begun in those areas assigned priority by external **Advisory Councils** (one for the marine district, one for the Great Lakes region), which then evaluated incoming research proposals. Proposals were also reviewed by **Technical Committees** for scientific content. The results of these reviews were presented to the Governing Board for final review prior to submission to the Office of Sea Grant.

**The Move to Albany:** In early 1972, the decision was taken by Chancellor Boyer to move the management of Sea Grant to Albany from the Marine Sciences Research Center, SUNY at Stony Brook, to emphasize the multiple-campus/two-coastline nature of the program. The program was attached to Central Administration of State University for support services but a final organizational arrangement was not defined. The **program management** unit was then composed of the director, an administrative assistant, and two half-time **Coordinators** (one for the Great Lakes, located at Oswego; one for the marine district, located at Stony Brook). The two coordinators, the program leader for Advisory Services (located at Cornell), and the director of the Water Resources and Marine Science Center at Cornell, comprised the **Cabinet**.

**Strengthening Management:** In response to suggestions from Office of Sea Grant review teams, strengthening of program management was undertaken in 1973 with the addition of an **Executive Officer** and elimination of the part-time coordinators. With restructuring of Cornell's Water Resources and Marine Science Center, participation by its director in the Cabinet was discontinued.

**Institute Staff:** On May 23, 1974, the concept of the Sea Grant Institute was approved by the Governing Board. That proposal stated:

**"Institute Staff.** The Institute will be headed by a director and such associate directors as the Governing Board directs. These officers will be employees of State University of New York or Cornell University as appropriate, and subject to appointment review by the respective trustees. The director will have a small staff to administer the program and provide liaison with the National Sea Grant Program."

The Program Leader of Advisory Services was recognized as **Associate Director** at that time, joining the management group consisting of: director, associate director, executive officer, assistant director (financial liaison). The formation of the Institute was formally announced in September, 1974.

**An Activist Mode:** Recognizing the need for the Sea Grant Institute to work more affirmatively with the state agencies and legislature, the title executive officer was abandoned and an **assistant director for program** created. The important difference in these distinctions is that the new post was not to be held by a member of the faculty, but rather by an externally-oriented implementor. The new position was filled in February 1979.

## **The Sea Grant Institute: Management Group**

**The Policy Studies Group:** In 1980/81, graduate students from the Graduate School of Public Affairs, State University at Albany, were brought to the Institute to form the **Policy Studies Group**. Together with the director, the assistant director for program, and a faculty advisor from the campus, this team reviewed areas in which the Institute could effectively seek to change state policy and priorities through interaction with agencies and with the State legislature. First legislative initiatives of the Institute followed in the fall of 1982. The resulting heavy involvement of Sea Grant Institute personnel in inter-agency, agency and legislative matters has been such that Board approval for a **second assistant director for program** was sought and the position added in 1983.

**Program Advisors:** Assisting the management team is a group drawn from the faculty of the institutions known as the **Program Advisors**. Program Advisors help set priorities and directions for the Sea Grant program. Specific functions include reviews of preliminary and final proposals being considered by the Institute. Current membership of the Program Advisors is given in Table I1.

Relationships among the management entities is shown in Figure I1.  
Responsibilities of management positions are given in Table I2.  
Program element summaries are shown in Tables I3-I5.

**Other Management Functions:** Communications were initially a function of the Institute's management team but were later established as an independent entity. For the development and status of communications functions within the Institute, see that section below. Similarly, extension has been an integral part of the management function, but its development and management is detailed in a following section.

Table II. Program Advisors, New York Sea Grant Institute

Robert Baker Chairman, Department of Poultry Science Cornell University	Robert Reis Professor of Environmental Law Faculty of Law and Jurisprudence SUNY at Buffalo
Boudewijn Brinkhuis Sea Grant professor of marine phycology SUNY at Stony Brook	Ralph Rumer Professor of Civil Engineering SUNY at Buffalo
Steven Brandt Sea Grant professor of Great Lakes sportfishery SUNY at Oswego and College of Environmental Science and Forestry	J.R. Schubel, Director Marine Sciences Research Center SUNY at Stony Brook
Jon Conrad Sea Grant professor of marine economics Cornell University	Ronald Scrudato Director, Research Center SUNY at Oswego
Robert Malouf Sea Grant professor of shellfish biology SUNY at Stony Brook	
<u>ex officio:</u>	Bruce T. Wilkins, Sea Grant Institute Michael Duttweiler, Sea Grant Extension Bruce DeYoung, Sea Grant Extension William Wise, Sea Grant Institute Laura McKay, Sea Grant Institute



Figure 11. Relationships among Management Entities

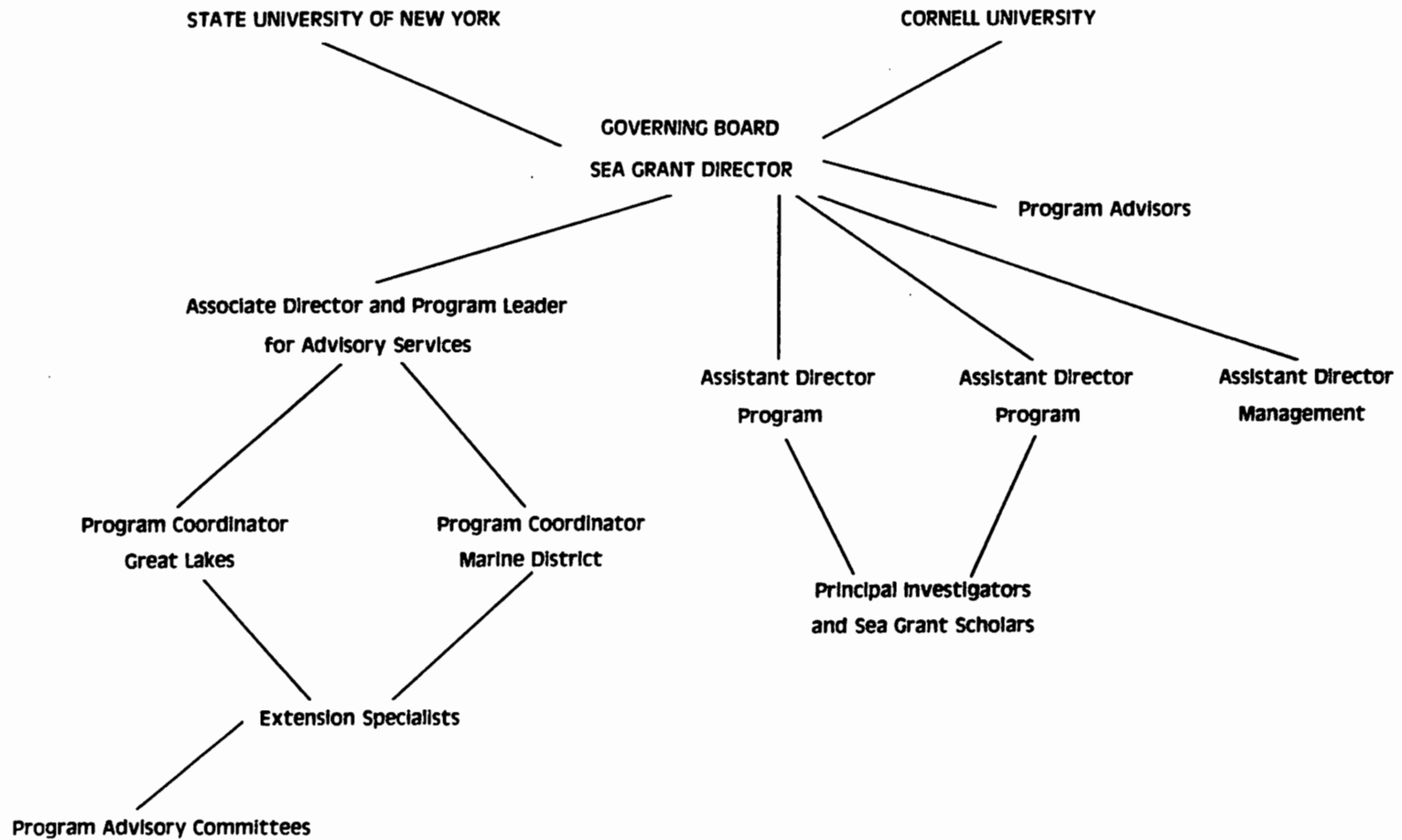


Table I2. Management Team of the New York Sea Grant Institute

Director:

Serves as secretary of the Board of Governors. Carries out policies established by the Board of Governors, the National Sea Grant College Program and other entities as necessary and required. Interfaces the Sea Grant Institute with the policies of the Trustees of State University of New York and or Cornell University and with the procedures and regulations of the financial administrator of the New York Sea Grant Program, The Research Foundation of State University of New York. Provides leadership for the Sea Grant program in New York.

Associate Director:

Is Program Leader for Sea Grant Extension, providing leadership for that program and interfacing it with New York State Cooperative Extension. Assists the director in the performance of his duties as required

Assistant Director for Management:

Interfaces the Institute, The Research Foundation of State University of New York and the Office of Sponsored Research of Cornell University. Provides personnel and financial management supervision to the Institute. Manages the Institute budget and staff.

Assistant Directors for Program:

Monitor research activities through regular and frequent contacts with principal investigators. Assist in program development. Represent the Institute on Task Forces, Inter-Agency Committees, and other similar functions. Develop and maintain contacts with governmental agencies, legislatures and private sector entities informing of research progress and results and interpreting these into legislative or agency actions.

The Sea Grant Institute: Management Group

Table I3. Program Management Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Program Management	M/X-1	M/A-1	P/M-1										
Central Services and Communications		M/C-1	P/M-2						C/P-1				
New Initiatives (Prog. Development)		M/I-1		P/M-3									

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	13	10	10	7	6	8	8	7	6	7	8	8	12
Percentage of pledged match	-	9	19	13	14	16	7	14	16	14	13	9	14
Percentage of total projects in year	4	10	6	8	9	8	6	6	7	6	7	7	6
Number of participating faculty	1	3	4	3	3	3	3	3	7	3	3	3	2
Disciplines of participating faculty	ADM	ADM	BIOL ADM	ADM	ADM	ADM	ADM	ADM	ADM FS	ADM	ADM	ADM	ADM
Research Publications - Articles	-	-	-	1	-	-	1	2	1	-	1	1	1
Reports	-	1	2	1	1	2	4	2	1	1	2	1	-
Popular	2	-	4	1	1	1	1	1	1	3	-	-	-
Other	-	-	-	-	1	-	3	2	-	2	-	2	-
Extension Effort-FTE - Marine	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	-	-	-	-	-	-	-	-	-	-	-	-	-
Extension Outreach - Publications	-	-	-	-	-	-	-	-	-	-	-	-	-
Information Pieces	-	-	-	-	-	-	-	-	-	-	-	-	-
Audio-Visual	-	-	-	-	-	-	-	-	-	-	-	-	-
Newsletter	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Participating Students	-	-	-	-	-	-	-	1	1	2	3	1	1
Theses Produced	-	-	-	-	-	-	-	-	-	-	-	-	-



**The Sea Grant Institute: Management Group**

**Table I4. Project Titles**

<b>M/C-1</b>	<b>Central Services - New York State Sea Grant Program</b>	<b>Squires</b>
<b>M/I-1</b>	<b>New Initiatives</b>	<b>Squires</b>
<b>M/X-1</b>	<b>Program Management and Development--New York State Sea Grant Program</b>	<b>Squires</b>

Table I5. Journal Articles

Brown, T.; Finegan, E.; Voiland, M.  
Current Use of Water Surface Zoning for Recreation.  
Water Resources Bulletin, Vol.15, No.2, April 1979.  
7900

Goolden, S.; Squires, D.  
Sea Grant Graduates: A Resource for the Nation.  
Marine Technology Journal, Vol. 17, No. 1, 1983.  
8300

Kantrowitz, B.  
Recipe for a Cooperative Technical Editing Program.  
Proceedings of the Council for Programs in Technical  
Scientific Communications, RPI, Troy, NY, April 1978.  
7800

Kantrowitz, B.  
Launching a Seaweed Farm, A Future Source of Energy.  
Aquaculture Magazine, January/February 1984.  
8400

Schwartz, M.; Voiland, M.  
Projected Economic Impact and Boat Launching Needs of Mature  
Salmonid Sportfishery for the Western New York Lake Ontario Shoreline.  
Recreation Impacts: The Great Lakes Ecosystem, Monograph 1,  
E. Carls, ed.,1979.  
7900

Squires, D.  
Integrity of the Water Environment.  
The Integrity of Water, Proceedings of a Symposium, Washington, D.C.,  
10 March 1975.  
7500

Squires D.  
A Marine Biomass Concept for the Northeastern United States.  
Northeastern Environmental Science Vol. 1, No. 2, 1982.  
8200

Warner, R.; Hefner, K.  
Alternative Sources of Protein for Calf Milk Replacer.  
Proceedings of the 1980 Cornell Nutrition Conference for  
Feed Manufacturers, Syracuse, NY, 4 November 1980.  
8000

## The Sea Grant Institute: Initiatives

### Institute Initiatives

New York Sea Grant Institute management differs from that of many Sea Grant programs. Rather than being only a manager of the program, the Institute management actively takes a leadership role, particularly at the state governmental level, in seeking to change state policies to better reflect the potential of the marine and coastal sector. The present organization of the Institute reflects that philosophy.

**Background:** By 1978 the Institute had become recognized within the State as a "continuing university activity" as opposed to one of the many ephemeral academic organizations which spring up with grant funds. The director and executive officer were engaged in several developmental projects such as the stimulation of a seafood industrial park in New York City and the creation of a seafood technology laboratory for Cornell's food scientists. Slow progress in these, and other ventures, caused the director to seek advice on role and function of the Institute. Professor Harold Adams, Graduate School of Public Affairs, SUNY at Albany served as a consultant and advised a more activist role for the Institute. That guidance was incorporated into the recruitment process of the then created post of assistant director for program (February, 1979), and the creation of the Policy Studies Group (January, 1980).

**Selected Examples:** Initiatives undertaken by the staff of the Sea Grant Institute range from research program<sup>1</sup> development to legislative action origination. Selected examples of these are listed below with short descriptions of what was undertaken and accomplished. Additional examples will appear throughout the text.

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<sup>1</sup> A research program is distinguished from research project. The former is a set of projects defined under some larger goal a priori. The role of the Institute in forming programs varies from defining specific tasks (e.g. The Great South Bay Study) to organizing a team which defines, in concert with the Institute, the projects which will constitute the program (e.g. The Marine Biomass Program) through identifying leadership which, without further participation of the Institute, carries out the research (e.g. The Coal Waste/Artificial Reef Project).  
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#### Research program monitoring

**What:** Research projects are closely followed by monthly telephone and quarterly personal visits which provide timely awareness of research developments and new ideas. **Why:** Close monitoring facilitates translation of research into action by the Institute. **Outcome:** New York Sea Grant's "Omnibus" Information System, started in 1976, was developed. This system consists of status reports of projects, information on Sea Grant Scholars, publication and report availability. Development of New York's Information System stimulated the development of the SGNET by the National Sea Grant Office.



## The New York State Marine Biomass Project

During the spring of 1979, the Re-entry & Environmental Systems Division (RES-D) of the General Electric Company, prime contractor to the Gas Research Institute (GRI), discussed participation in the national marine biomass program with the NYS Energy Research and Development Authority (NYSERDA). The Sea Grant Institute was invited to participate in that briefing because Otto Klima, Vice President of RES-D and some-time member of the National Sea Grant Advisory Committee, encouraged his staff to work with Sea Grant institutions.

New York, through NYSERDA, was prepared to fund an initial year of work and proposed that Sea Grant develop a proposal to be handled as a subcontract with GE. Sea Grant Program Development Funds supported preliminary research leading towards the contract. Second year research was carried out under direct sponsorship of GRI (but multiply funded) in parallel with GE. Sponsors included NYSERDA, GRI, and the New York Gas Group.

The objective of the project has been to develop a feasible system for the production of marine biomass in mid-Atlantic waters from indigenous macroalgae for economically competitive conversion to synthetic natural gas. That goal has nearly been reached.

The first contract period, December 1979 - July 1980, was spent in building a research team and a workspace. The first team consisted of biologists from the Marine Sciences Research Center, SUNY at Stony Brook, coastal law scholars from SUNY at Buffalo, and a planner from the Long Island Regional Planning Board. A major greenhouse laboratory was constructed next to the Flax Pond Laboratory, Stony Brook, with culture tanks and seawater system. Culture work began; the coastal law group completed four reports on environmental/legal issues of seaweed farming and the planner had completed a jurisdictional/regulatory/operational/socio-political evaluation of potential farm sites around Long Island.

In 1980 and 1981 the research team was expanded to include engineers from Stony Brook. This commenced the much-needed dialogue between biologists and engineers which the west coast biomass project had lacked. Novel biomass test farms were designed and the first attempts at raft culture of seaweeds in the field were undertaken successfully. Biological work in both laboratory and field on seaweed growth, fouling organisms, and environmental measurements at the selected test farm site were undertaken in 1982. Experiments on seeding and harvesting strategies for the kelp, Laminaria saccharina were greatly aided by Dr. X. Fei from Qingdao, China.

In 1983 a national workshop on seaweed raft and farm design was held and preliminary farm designs evaluated. The final design selected was similar to Japanese seaweed farms. Permits for deployment of this test farm one mile offshore in Long Island Sound in 60' of water were secured.

In September 1983, following mathematical analysis by Cornell engineers, of wave and current stresses on the structure, the test farm was put together, on site, in Long Island Sound. During 1983 work continued on seeding, harvesting, and chemical composition experiments and on isolation of strains of fast-growing individuals.



In February of 1984 the first kelp plants were put on the farm. Planting of the farm had been delayed by severe weather. In late March a "100-year" storm ripped through Long Island Sound damaging neither the farm structure nor the kelp. Careful engineering design in cooperation with the biologists had prevented a major loss. The first crop was harvested during the last week of June 1984 and the summer crop put on the farm. Thus the ultimate goal of demonstrating the feasibility of producing marine biomass in mid-Atlantic waters has been proven on a test farm scale. Companion research of the Institute of Gas Technology has shown the economically competitive conversion efficiency. It remains now to design a large scale production/harvesting/conversion system.

#### Funding History - NYS Marine Biomass Project

	1979	1980	1981	1982	1983	1984
GE		\$119,219				
NYSERDA			\$170,000	\$200,000	\$200,000	\$56,240
GRI			\$170,000	\$329,274	\$294,500	\$253,300
NYGas				\$50,000	\$50,000	\$50,000
subtotal		\$119,219	\$340,000	\$579,274	\$544,500	\$359,540
SUNY/Cornell		\$32,464	\$25,164	\$36,278	\$25,134	\$25,424
Sea Grant	\$3,000					
TOTAL	\$3,000	\$151,683	\$365,164	\$615,552	\$569,634	\$384,964

Research program development

**What:** The Coal Waste/Artificial Reef Project, CWARD, was started with Sea Grant developmental funds. **Why:** Professor Iver Duedall, Marine Sciences Research Center, SUNY at Stony Brook, saw conversion of oil-burning electric-generating stations to coal creating enormous disposal problems for scrubber sludge and ash. A novel solution was proposed. **Outcome:** With support from state and federal agencies and electric power research entities, a five year program costing about \$3.5 million was started. Fly ash and scrubber sludge was converted to blocks satisfactory for artificial fishing reef development in the marine environment. The concept was extended by the Institute, with Sea Grant funds, to the Great Lakes where testing is underway. Complimentary research on the relationship between "ocean dumping" and "artificial reef construction" was undertaken by the Coastal Law Center, SUNY at Buffalo. The disposal process is being utilized by industry.

**What:** The Sand and Gravel Mining Program, developed at the request of a state agency, managed by the Institute under contract with that agency. **Why:** A state agency would not issue permits until environmental issues were settled. The agency with authority to lease underwater lands for mining sought Sea Grant assistance to regain royalty revenues from mining being lost to the state. **Outcome:** an extensive multidisciplinary research program on underwater mining but no definitive change in state policy; a new research initiative in use of mined holes for disposal of dredge spoils commenced with pass-thru funding.

**What:** The Great South Bay Study was developed by the Sea Grant Institute at the request of a state agency which planned to participate in its support. **Why:** This productive bay was the site of the major hard clam fishery in the nation, but clam production was declining--a knowledge base was required. **Outcome:** A five year comprehensive investigation of bay productivity, supported by Sea Grant funds when agency support collapsed, has resulted in numerous technical papers reflecting a new comprehensive understanding of the Bay. That information is now being used in a series of management-practice oriented projects supported by local governments. A semi-popular summary volume is being prepared.

**What:** The Marine Biomass Program, developed and initially managed by the Institute as a multiple-campus, inter-disciplinary program supported by state and industry contracts. **Why:** Participation of Sea Grant institutions in the national marine biomass program was being urged. Algal biomass offers alternative sources for methane and possibly other energy forms in the event of recurring energy shortages. **Outcome:** A demonstration that algal biomass can be successfully farmed in the northeast; extensive research valued at \$2 million on macroalgae of the northeast; a spin-off Sea Grant supported program on fermentation products from macroalgal feedstocks.

Facilities and academic development

**What:** The MESA New York Bight Project, NOAA, headquarters was brought to New York and located on the SUNY at Stony Brook campus. **Why:** As an emerging research entity, the Marine Sciences Research Center, SUNY at Stony Brook, could benefit from the co-location of a federal program. Sea

## **The Sea Grant Institute: Initiatives**

**Grant** had the institutional and political capabilities to affect the siting decision. **Outcome:** The MESA New York Bight Project (and its successor offices) was located at SUNY at Stony Brook. The collaborative programs between NOAA and the university have been numerous, including a Cooperative Agreement for research activities.

**What:** A field station offering Cornell's seafood scientists an opportunity to work, shoreside, with fish and shellfish was sought. **Why:** No adequate marine based research facilities for food scientists existed within the state. **Outcome:** The New York State Seafood Technology Laboratory-- A collaborative activity of the College of Agriculture and Life Sciences at Cornell and Kingsborough Community College, City University of New York has been negotiated and state appropriated funds and authorizing legislation attained under the leadership of the Institute.

**What:** The Shellfish Disease Diagnostic Laboratory to assist shellfish hatchery operators with disease control is sought as a spinoff of Sea Grant sponsored research. **Why:** Sea Grant sponsored research on control of hatchery disease indicated to shellfish aquaculturists that aquatic veterinary services were feasible and essential for their operations, but they could not yet afford to support such activities. **Outcome:** With the New York State College of Veterinary Medicine, site and funds for this laboratory are being developed for initiation in 1985. It will be located collaboratively with the Marine Sciences Research Center, SUNY at Stony Brook.

### **Coastal industrial development**

**What:** Bringing seafood industries back to New York City to provide quality seafoods and to increase employment opportunities was the goal. **Why:** Seafood industries located in New York City had almost entirely left the area. Sea Grant sponsored seafood research provided a knowledge base which could be used as leverage in gaining governmental support for establishment of a seafood industrial park. **Outcome:** Fishport, Erie Basin, Brooklyn, an \$85 million industrial park resulted from Sea Grant's efforts to stimulate the Port Authority of New York, the City of New York and the State of New York to develop a major seafood processing center.

**What:** Creation of an academic focal point for Great Lakes research. **Why:** New York lacked a strong Great Lakes research program commensurate with that of other states. Inter-institutional cooperation was made difficult by divisions over facilities and geographic locations. **Outcome:** Although first thinking was of a land-based center, Sea Grant Extension Specialist Michael Voiland turned the initiative into the highly successful E/V Ontario project. Now a "Lake Ontario Sportfishing Center" is conceived as a possible joint project of the City of Rochester and various state agencies and a developing Great Lakes focussed university consortium.

### **Fostering agency involvements in marine affairs**

**What:** The Institute perceived a need to improve awareness of marine resource issues among senior agency officials. **Why:** Education on marine issues was being undertaken agency by agency, individual by individual: A structured mechanism was sought. **Outcome:** The Marine Policy Forum -



## Bringing MESA to New York

In early 1972, D.F. Squires, then at the Marine Sciences Research Center, SUNY at Stony Brook learned of plans by the National Oceanic and Atmospheric Administration (NOAA) to locate the New York Bight Project of the Marine Ecosystems Analysis Program (MESA) at one of several possible sites in the area. In consultation with university officials it was decided that a determined effort should be made to locate that project at SUNY at Stony Brook. The advantages of gaining the project were:

1. Greater awareness in the ocean research community of the Marine Sciences Research Center as the locus of State University's marine program. Stony Brook was then a tender young campus emerging from national notoriety about drug use on campus.

2. Enhanced scientific capability through the mix of federal, state and university personnel--the NYS Department of Environmental Conservation, under David Wallace's leadership, had just located its Marine and Coastal Division on the campus.

3. Potentially greater involvement of the university in sponsored research of the MESA project as a result of propinquity.

In April, 1972, President John Toll, SUNY at Stony Brook, wrote to David Wallace, then Associate Administrator of NOAA, requesting consideration of Stony Brook as the site of the project. But, rumors reaching New York from Washington indicated that NOAA's Sandy Hook Laboratory was the favored site. Squires, now located in Albany as director of Sea Grant, discussed the matter with colleagues in SUNY Central Administration. On May 17, 1972, in an evening meeting with Assistant Provost David Owen and the university's legislative liaison officer John Mather, it was decided to seek the help of Governor Rockefeller. An appointment was gained that same evening with Robert Douglas, Secretary to the Governor, at which he agreed to take the matter up with the Governor.

The strategy: Governor Rockefeller was to bring up the matter in his weekly call with President Nixon while Douglas would telegraph John Erlichman, chairman of the Domestic Council, conveying the state's interest in hosting the MESA project. These actions were to occur the following day--May 18. Squires flew to Washington following the meeting to confirm that action was taken. The following mid-morning he waited outside Administrator Robert White's office to determine if the White House would indeed make the phone call to White: The call was made.

On February 5, 1973, Allan Hirsch, director, MESA Program, NOAA, recommended to Administrator White that Stony Brook be selected for the MESA New York Bight headquarters: On February 20, White indicated his concurrence and in August the MESA New York Bight Project was located on the Stony Brook campus. Between then and September 1981 when the project terminated, the project had expended over \$3 million in academic research in New York. The Marine Sciences Research Center at Stony Brook was a principal in this research and, in 1982, a Cooperative Agreement was developed between the MESA Project successor office and the Center.



organized and carried out by the Institute, consisting of monthly briefings for senior agency professionals, brought new ideas and concepts to the attention of the state.

**What:** Increasing academic participation in state-level decision-making on marine and coastal resources. **Why:** To more quickly translate knowledge gained through Sea Grant investments into action. New York officials had a negative attitude towards indigenous academic resources, yet through Sea Grant, national-class resources had been developed. **Outcome:** The Institute, and researchers and extension staff identified by it, have participated on numerous formally constituted bodies appointed by the Governor, a Commissioner or the Legislature:

Shellfish Disease Inter-Agency Task Force (Environmental Conservation, Health, Agriculture and Markets, Sea Grant)

Stripped Bass Task Force (Commerce, Environmental Conservation, State, Sea Grant)

Agriculture 2000 Study (Led by Agriculture and Markets, Cornell's College of Agriculture and Life Sciences, Sea Grant, with industry representatives)

Food Policy Steering Committee (Legislative body composed of numerous agencies, industry representatives and individuals)

Food Industry Task Force (Commerce, Agriculture and Markets, Sea Grant)

Aquatic Resources Development Task Force (Commerce, Agriculture and Markets, State, Port Authority of New York and New Jersey, Sea Grant)

Governor's Advisory Council on Agricultural Marketing (Agriculture and Markets, Cornell's College of Agriculture and Life Sciences, Sea Grant)

#### Legislative initiatives:

**What:** Involving the State Legislature and Agencies in furthering the development of marine and coastal resources. **Why:** Mid-1979, the Institute was contacted by the Assembly Subcommittee on Food, Farm, and Nutrition Policy regarding the prospects for local aquatic food production in upstate New York. Subsequent discussion led that and related legislative staff to solicit the expertise of the Institute represented by the pool of researchers, publications and students, in developing a legislative package addressing needs of New York's aquatic products<sup>1</sup> industries.

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<sup>1</sup> The term "aquatic products" was developed in a later task force as a means of politically expressing marine and freshwater food and non-food production by commercial fishing, aquaculture or other means.  
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Institute staff worked closely with the Legislature over the next several years in the formulation of such legislation.

**Outcome:** Specific legislative successes are:

- o Statewide Aquaculture Plan requesting the Sea Grant Institute and Cornell's College of Agriculture and Life Sciences to prepare an aquaculture development plan for New York

- o Authorization for the Department of Agriculture and Markets to provide assistance in marketing and promoting the products of New York's aquatic products industries

**The Sea Grant Institute: Initiatives**

- o Authorizing legislation for the New York State Seafood Technology Laboratory as a cooperative program of Cornell, SUNY, and City University of New York (pending); start-up funding appropriated

- o Legislation defining a supportive state policy towards aquatic products industries and establishing an advisory board to coordinate agency policies and programs affecting these industries (pending).

Involvement with the Legislature over the past 4 years has resulted in broad recognition of the Sea Grant Institute within the Legislature and Executive Agencies as a source of analysis and informed advice on coastal issues. New legislation now stems from program bills or legislative committees, with participation by the Institute, rather than directly from the Institute.



## Sea Grant and Fish Port

Through the efforts of many, a seafood industrial park has been created in Brooklyn. In 1984, \$27 million will be invested in infrastructure development. An additional investment of \$55 million is planned. An additional \$3 million will be spent on fishery development in the Port Area (New York and New Jersey). Eight seafood processing firms are expected to sign leases in 1984 creating 460 direct jobs. An additional 1,400 indirect or induced jobs are projected. Regional sales are projected to be \$130 million, regional tax returns \$3 million and annual payrolls of \$23 million. Sea Grant played an important role in this major development.

New York City was vitally interested in having an outer continental shelf oil and gas support base located in the Port. Carl Sobremisana, a planner in the NYC Planning Department, conceived of co-locating seafood industries at such a support base. In November 1977, this idea was presented at a Maritime Administration meeting attended, as resource persons, by Sea Grant Extension Specialists Peter Sanko and John Scotti.

MARAD cost-shared a marine industrial park (co-location) study with New York City, a component of which was a seafood park. Sea Grant agreed to provide technical information and to discuss the concept with the NYS Job Development Authority and the NYS Department of Commerce. As federal agencies such as MARAD and NMFS became involved with studies the project tended to become lost in the bureaucratic jungle and fuzzed into obscurity.

Sea Grant now saw an opportunity to help lead the project through the bureaucratic jungle: Senior officials were at best lukewarm; interested junior officials were too far down in their organizations. In March 1978, Sea Grant informed Deputy Mayor Robert Wagner, Jr. that Tom Kitsos (House Merchant Marine and Fisheries staff) and Congressman John Murphy (R.-Staten Island and Chair of that Committee) had been briefed and were interested and supportive. Wagner, leading the City's economic development movement, became interested and a briefing was arranged. Wagner urged Sea Grant to get the help of the newly formed Business Marketing Corporation (BMC), a private sector initiative to attract business to the City.

By mid-April, 1978, the Port Authority of New York and New Jersey (PONYA) had evinced its first interest in the project. The Supervisor of Port Development asked Sea Grant to brief PONYA on the seafood park project. Sea Grant was told that PONYA's interests would continue, but would be carried out by a Regional Economic Development Task Force of PONYA.

Meanwhile, the project was pressed onwards with the Business Marketing Corporation (BMC). The Vice President of BMC was assigned the lead to develop a marketing proposal to gain industry interest. A BMC report was issued outlining the industry potential and naming four sites, identified by NYC Planning, for such a facility: Erie Basin, Brooklyn; Brooklyn Army Terminal; Stapleton, Staten Island; and Hunts Point, The Bronx. This action, more than any other, politicized the project and derailed it for several years: PONYA, owner of Erie Basin was reluctant to be involved in inter-borough squabbles; the Brooklyn Borough President's Office was interested only in redeveloping the Brooklyn Army Terminal; State Senator Marchi, R-Staten Island, a powerful force, still remembers to this day that Sea Grant was involved in a project which rejected the Stapleton site; and, Black Caucus forces, with which Sea Grant had had good rapport, were unhappy about the lack of enthusiasm for a South Bronx location.



It soon became clear that BMC was not going to move the project and that its only significant role would be carrying on the monthly interagency meetings on the project. In 1979, the committee, through NYS Commerce Department, had obtained NYS Coastal Management funds for a feasibility study. Westgate & Associates were engaged as consultants and on July 30, 1980 their report "Fisheries Development Opportunities for New York" was released recommending Erie Basin, Brooklyn as the site.

On November 30, 1979, PONYA released a broad ranging report on waterfront redevelopment in the Port area prepared by its Committee on the Future, Regional and Economic Development Task Force. According to the letter of transmittal for the document, the Commissioners of PONYA had initiated this activity "in late 1977." Sea Grant had also been involved with many of the subgroups of this task force. One recommendation of the task force was that a study be made of the marketing potential for commercial fishing industry in the Port area. "The Commercial Fishing Industry: Marketing Potential in the New York-New Jersey Region" prepared by PONYA was issued March, 1979.

In June 1979, the State Legislature became involved. Its Assembly Subcommittee on Ports and Terminals, with former Sea Grant Extension Specialist Richard Raymond as staff, issued a report in May 1979, recommending creation of a seafood industrial center--identifying Brooklyn Army Terminal as the site.

At this stage, with at least four organizations involved and each sponsoring meetings on a seafood industrial center, Sea Grant took a lowered profile. Sobremisana left NYC Planning to go with MARAD; the BMC quietly went away; PONYA issued a stream of definitive reports; the NYS Legislature convened meetings of all parties.

By this time the Sea Grant initiative for a Seafood Technology Laboratory, to be located at Kingsborough Community College near Erie Basin, was well developed. This initiative and the "Erie Basin Project" became interwoven with the laboratory being considered an asset to the facility.

Through 1980 and 1981, the Sea Grant Institute met frequently with PONYA officials offering assistance, industrial contacts, and discussing the possible benefit to the project of the Seafood Technology Laboratory and Sea Grant Extension activities in seafoods. But the economy declined making furtherance of the project questionable--morale sagged. National Marine Fisheries Service turned actively negative towards the project. PONYA released a series of consultants' reports.

Re-organization of PONYA resulted in the formation of a New Ventures group. Under the leadership of Brendon O'Malley, there was renewed vigor. PONYA was again issuing marketing materials by mid-1981, but commitments from industry were hard to get in the face of the deepening recession. Without tenants, PONYA would not put the issue before its Board of Commissioners for approval. However, the aggressive marketing program began to work in 1982 and, with an upturn in the economy, PONYA began to get commitments from tenants. By late 1982, though, New Jersey interests were active in opposition, and these interests threatened the project which required bi-state approval.

From August through December, 1983, monthly meetings of the Commissioners were fraught with suspense--would the proposal go? On November 2, Governor Cuomo pushed hard--and succeeded. On December 8, 1983 Alan Sagner, Chairman of the Port Authority Commissioners, announced that Fishport would become a reality.



## The Sea Grant Institute: Advisory Bodies

### External Advisory Bodies

**The Advisory Councils:** Even prior to the award of the Planning Grant awarded to start Sea Grant in New York, two advisory councils had been established: one for the Marine District of New York; one for the Great Lakes region of the state. Membership of these councils is listed in Table 16.

Table 16. Membership of the First Advisory Council

#### Marine District

Chair: David Wallace, NYS Department of Environmental Conservation

Lee Koppelman, Nassau-Suffolk Regional Planning Board  
Clarke Williams, Nassau-Suffolk Regional Planning Board  
Leo Geyer, Grumman Corporation  
Thomas Bishop, Moran Towing and Transportation Co.  
John Suydam, National Boatmen's Alliance  
John Binner, Sportsman's Council  
J. Richards Nelson, Long Island Oyster Farms  
Harry Kilthau, Great South Bay Waterfowler's Association  
Richard Peffenbach, Oceanographic Fund Inc.  
Irving Like, Reilly, Like and Schneider

#### Great Lakes Region

Chair: Thomas Dyer, Metropolitan Syracuse Water Board

James Bartlett, Niagara Mohawk Power Corporation  
Allen Brandt, Bethlehem Steel Corporation  
William Steinfeldt, Eastman-Kodak Company  
Warren Ferguson, Allied Chemical Corporation  
David Knowlton, Knowlton Brothers Inc.  
W.D. Tyler, Associated NYS Food Processors Inc.  
Robert Hansen, US Army Corps of Engineers  
Lawrence Moriarty, Federal Water Quality Administration  
George Wilson, St. Lawrence Seaway Corporation  
James Bruce, Canada Centre for Inland Waters  
Albert Hall, NYS Department of Environmental Conservation  
Leonard Crook, Great Lakes Basin Commission  
Royal LaLonde, Hutchinson's Boat Works Inc.  
William Hicks, NYS Department of Health  
Meredith Thompson, NYS Department of Health  
Sam Williams, O'Brien & Gere

**Council Functions:** These councils met several times and helped in setting priorities used in the formulation of the first Institutional Proposal. Those priorities are summarized in the following Blue Pages. The two councils continued to meet, continued to participate in the process of selecting research projects, and attempted to set longer term goals. The goal-setting process culminated in 1974 when both councils submitted lengthy statements of long-range goals.

**Restructuring the Councils:** The councils were becoming unwieldy. They were large, and there was pressure to enlarge them further to obtain "broader" or "more proportionate representation." From the viewpoint of program

## **The Sea Grant Institute: Advisory Bodies**

management, it was increasingly difficult to define meaningful and substantive roles for the councils. Research called for by the councils had been initiated but results were slow in coming; research completed tended to define "a logical next step", and research project selection decisions increasingly involved matters difficult for a non-technical group. But the developing program of Sea Grant Extension offered an alternative. Here was a body capable of undertaking short-term response and delivering results in a timely way. Increasingly, the matters urged upon the program by the councils were of the type which could and should be dealt with by Extension. For these reasons, the Institute restructured its external advisory system in the period 1974 to 1975.

**Advisory Committees and the Statewide Council:** The model called for each Extension Specialist to create a separate advisory committee related to his or her extension programming. For each committee a member was designated as the group's delegate to the Statewide Advisory Council. That group was further enriched with representatives of state and regional agencies and "at-large" members. The new system provided for many more members, created topically focussed groups with common interests and provided for greater involvement of Extension staff with the advisory process. In 1976 there were ten advisory committees with representation on the statewide council. The composition of that Council is listed in Table I7.

**Sea Grant and Coastal Zone Management:** This system worked effectively, but in the late 1970's New York's Coastal Zone Management Program had begun to develop. As it formulated plans, an external advisory body was required. Naturally the state program absorbed much of the membership of the already existing Sea Grant group. As their membership co-mingled, the roles of the Sea Grant and coastal management advisory groups became confused. Many regarded the policy shaping function of the coastal management council more meaningful than the priority setting of a research and extension agenda. The difficulty of establishing a meaningful role for the council continued and it was decided to terminate the council in 1981. The Governing Board instructed that an alternative means of gaining external advice be developed.



Research Priority Outline Developed by the Marine Advisory Council  
September 30, 1970

(in descending order of priority within major headings)

- I. Marine Environmental Quality
  - A. Impact of Waste Heat Disposal
  - B. Chemical, Pesticide and Petrochemical Pollution
  - C. Domestic, Industrial and Agricultural Waste Waters as Nutrients
  - D. Waste Solids in the Coastal Environment
  - E. Biological Effects of Environmental Misuse
- II. Coastal Utilization and Management
  - A. Coastal Stabilization and Protection
  - B. Wetlands Conservation
  - C. Recreation
  - D. Water Resource Management
  - E. Pollution Abatement
  - F. Environmental Restoration
  - G. Substrate Inventory
- III. Marine Resource Development
  - A. Mineral Resources
  - B. Fin Fisheries
  - C. Shell Fisheries
  - D. Industrial Development

Research Priority Outline Developed by the Great Lakes Advisory Council  
November 10, 1970

(in descending order of priority within major headings)

- I. Environmental Quality
  - A. Combined Sewers
  - B. Heat and Thermal Effects
  - C. Solid Waste and Sludge
  - D. Agricultural Runoff
  - E. Urban Runoff
  - F. Ground Water Quality
  - G. Algal Control and Weeds
  - H. Pesticide, Petrochemical and Radioactivity
  - I. Shoreline Processes
  - J. Water Quality Parameters (include this aspect in all)
  - K. Monitoring
- II. Utilization and Management
  - A. Recreation--Devices
  - B. Evaluation of Policy and Practice
  - C. Institutional Arrangements
    - 1. Regulation
    - 2. Watersheds
    - 3. Metropolitan Areas
    - 4. Lakes Ontario and Erie
    - 5. The Great Lakes
    - 6. Financing



- 7. Enforcement
- D. Physical Management
  - 1. Lake Levels and Flow
  - 2. Coastal Stabilization and Protection
  - 3. Zoning--Land Use
- E. Resources Allocation

### III. Water Resource Development

- A. Mineral Resources
  - 1. Gas
  - 2. Oil
  - 3. Gravel, Sand, etc. (environmental impact)
- B. Food
  - 1. Fishery
    - a. Sport
    - b. Commercial
  - 2. Aquaculture
  - 3. Increased Productivity
  - 4. Birds and Animals

Table 17. Membership of the 1975-1976 Statewide Advisory Council

Coastal Recreation Advisory Committee	- Kenneth Crayton, Rochester
Salmonid Information Advisory Committee	- Michael Donovan, Sandy Creek
Marine Youth Education Advisory Committee	- Eugenia Flatow, New York City
Coastal Processes Advisory Committee	- Paul Fox, Rochester
Shellfish Advisory Committee	- Barry Klaassen, West Sayville
Statewide Marine Committee	- W. Arthur Knorr, Syracuse
Lake Erie Regional Advisory Committee	- Richard Mayer, Fredonia
St. Lawrence Advisory Committee	- James McGuinness, Ogdensburg
Commercial Fishing Advisory Committee	- Richard Miller, East Quogue
Coastal Engineering Advisory Committee	- Edward Parthe, Lindenhurst
Atlantic representative-at-large	- Claire Stern, Port Washington
Great Lakes representative-at-large	- Marjorie Vesley, Williamsville
Nassau-Suffolk Regional Planning Board	- Lee Koppleman
Erie-Niagara Co. Regional Planning Board	- Leo Nowack
NYC Planning Commission	- M. Ismail Khan
NYC Environmental Protection Admin.	- Martin Lang
NYS Dept. of Environmental Conservation	- Theodore Hullar
NYS Office of General Services	- Charles Jennings
NYS Dept. of Commerce	- Raymond Paolino
NYS Public Service Commission	- Dennis Rapp
NYS Geological Survey	- William Rogers
NYS Office of Parks and Recreation	- Ivan Vamos
Div. of State Planning, NYS Dept. of State	- Henry Williams

## **The Sea Grant Institute: Advisory Bodies**

**Program Advisory Committees:** The alternative to the Statewide Advisory Council was the formalization of the extension advisory committees as Program Advisory Committees. The current PAC's, as they are referred to locally, are listed in Table I8. The primary function of these groups is to assist Extension Specialists in their program development. Effectively used, however, the Program Advisory Committees are also a means of increasing the priority of needed research in support of an Extension Specialist's activities. Awareness of research activities is maintained through meetings of Institute and Extension staff, meetings of the Director with Program Advisory Committees, and through review of research proposals by extension staff, sometimes in concert with the Program Advisory Committee. An orientation sheet prepared for prospective Committee members is presented in the following Blue Pages.

**Table I8. Current Program Advisory Committees**

Coastal Engineering/Facilities	12 members
Commercial Fisheries	15 members
Lower Hudson	15 members
Marine Education	10 members
St. Lawrence Region	8 members
Coastal Processes/Management	10 members
Sport Fishery Development (two committees)	20 members
Great Lakes Youth Education	10 members
Lake Erie Region	8 members

For the past two years, the six Great Lakes Program Advisory Committees have sent representatives to a regional PAC meeting to discuss broader program concerns.

**Other Advisors:** The Institute has experimented with other devices for gaining external advice. From time to time establishment of a state agency group has been considered. The agency response is generally that there is sufficient interchange through various meetings, the Marine Policy Forum and other activities, to provide the Institute with a view of agency interests and priorities. The Institute routinely requests agency review of research proposals.

**The Future:** There are clear opportunities for the development of a statewide body to address the needs and concerns of the coastal region. Instability of the National Sea Grant College Program and the reshuffling of responsibilities within the state agencies have been the reasons for not moving forward with such a development.





## Program Advisory Committees

### Introduction

This guide is for members and prospective members of Sea Grant Program Advisory Committees (PAC). It will help you in identifying the responsibilities, satisfactions, benefits and achievements typically experienced by PAC members. It also provides insight on roles and expectations of PAC held by the sponsoring Regional Extension Specialist.

### What's Sea Grant

Sea Grant is a state and federal program designed to help people solve coastal problems. In New York, it is administered through the State University of New York and Cornell University. When information is lacking, Sea Grant provides funds to university faculty for research on issues ranging from off-shore mining, dredge disposal and erosion control to commercial fisheries, coastal tourism and marine education. This information is then made available through the Sea Grant Extension Program to you, to other groups, to industry, and to local governments.

### What Does the Sea Grant Extension Program Do?

The role of New York's Sea Grant Extension Program is to carry out educational efforts that will help coastal residents, users and decision makers resolve current and projected problems while developing and conserving the coastal resources of New York State. To carry out this role, the Extension Program:

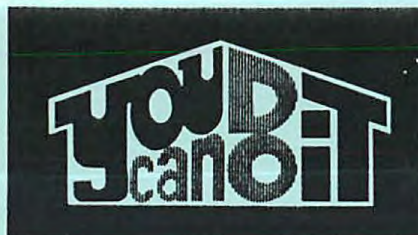
- Transfers knowledge to persons who can use it to solve coastal problems.
- Stimulates appropriate persons to apply this knowledge to solving problems.
- Stimulates researchers to generate knowledge needed to solve coastal problems.

The educational programs of Sea Grant Extension Specialists vary according to the needs of geographic regions. The roles played by Extension Specialists also vary as they:

- Identify priority information needs using advisory committees, current research and other sources.
- Implement problem-solving educational programs and activities with: commercial fishermen, marine recreation industries, seafood processors and handlers, consumers of marine foods, marine mining industries, coastal zone decision makers, coastal property owners, marine recreationists, urban minority youth, and others.
- Assist in developing the directions of future Sea Grant research efforts so they are in accord with needs of the coastal users and the welfare of society.
- Maintain and further developing working relationships with other agencies and groups so resources are used more efficiently and programs are implemented more effectively.

### What Is A Program Advisory Committee?

A Program Advisory Committee (PAC) is a group of advisors to a regional Sea Grant Program. Program advisory committees are used by Extension Specialists along the Great Lakes and the Marine District (downstate) coastline. Though subject areas vary considerably from one advisory committee and specialist to another, the values of the relationship between the advisory committees and specialists are, for the most part, very similar.



Program Advisory Committees provide specialists with assistance in:

- Identification of community educational needs and their priorities.
- Identification of research needs.
- Conducting educational programs and evaluating those programs.

In short, advisory committee members provide grass roots guidance for Sea Grant educational programs insuring responsiveness to real needs that you, your neighbors and local officials are experiencing.

### Who Serves on Program Advisory Committees?

The Sea Grant Extension Specialist contacts concerned citizens from the area of geographic responsibility (2-5 counties) who might be likely candidates. Committee members are usually appointed for a specific length of term. Committee members are volunteers and receive no monetary compensation for their efforts.

### How Often Does The Program Advisory Committee Meet?

Committees typically meet between 3 and 4 times annually. Meetings will vary in format but will often be:

- Held in a Committee Member's office, place of work or in another central location;
- Of more than several (2-3 hours) duration;
- A tour or presentation on a Committee Member's project or special interest;
- Reviews of action oriented education projects underway or planned with members, or may include guest speakers.

Your meeting notice will include an outline of the agenda. Meeting minutes will keep you abreast of group plans and commitments.

### How Do Committee Members Benefit?

The benefits to committee members are, to a large extent, as many and varied as each member makes them. Some of the more common benefits include:

- Gaining of sense of community contribution;
- Learning about the programs and priorities of others with similar interests;
- Participating in action oriented programs.

### Will Your Thoughts Count?

Typically, the PAC will develop a comprehensive list of educational needs annually. Needs will be reviewed and given priorities by that committee. Sea Grant Specialists consider these priorities in developing educational programs for the year.

### How Do We Know It's Worthwhile?

Sea Grant Extension Specialists periodically carry out evaluations for major program efforts. The same may be done by Committee Members individually, collectively, or in partnership with the Specialist. Evaluation tips can be gained from the specialist for your purposes as well!

So, if you have an interest in stimulating needed coastal change for your business or community.....dive in!

by Stephen Lopez  
Extension Specialist

Bruce DeYoung  
Program Coordinator



December 1980

# RESEARCH



## The Research Program

### Introduction

Through the guidance of strong external advisory groups, the New York Sea Grant program commenced with well defined objectives which translated into a number of defined research areas. As expected these were not completely in phase with research interests of the faculty or the facilities of the campuses. As a result, through the first several years of Sea Grant there was a shifting of program organization and content as an appropriate match between program desired and resources available was sought. By 1974, the development of a number of research capabilities had yielded rewards permitting a more focussed program.

**Evolving Research Policy:** Initially Sea Grant was dominated by the interests of State University's Chancellor Ernest Boyer in developing the capabilities of the university colleges. This was reflected in the first research policy statement of the Board: "We first support quality research, but we also give appropriate weight to breadth of distribution of program elements. We strongly back committing a portion of our resources to the development of promising, young, inexperienced researchers." Within three years, however, site visit review teams were expressing more strongly their feelings that the research program lacked the strength and vigor which might be expected. In November, 1975, the Board sharply revised its research policy (reflecting both the concern of the Board for the character of the review team comments and also its reconstituted nature): "The primary criteria for selection of projects should be the quality of the research activity; its relation to the objectives and to the plan of the development of the Institute; and effective utilization of the resources of New York State." This policy has remained without restatement.

**Developing Centers:** At the same time that the Board revised the Institute's research policy, it strengthened the research program: "The Board takes cognizance of the difficulties of inter-disciplinary, multi-institutional research coordination and expresses the future potential of strong research clusters." This policy was implemented through the direct identification of disciplinary focal points throughout the academic community of the state. Some focal points were natural because the resources were unique: aquatic pathology at the state's only veterinary college; seafood science at Cornell's renowned Food Science Institute; coastal oceanography at the statewide center for marine sciences at Stony Brook.

In other situations, choices had to be made: for coastal law, SUNY at Buffalo's law school was chosen over Cornell's (and other private institutions); public policy was focussed at SUNY at Albany instead of many other centers. Such "choices" were not exclusive, but were a conscious decision to stimulate activity at that center--proposals from any other institution would be treated competitively on merit. Some early choices did not work out: public policy at SUNY at Albany became technique oriented and accordingly of less value to Sea Grant. Our focus has shifted to the Baldy Center, SUNY at Buffalo



## Research: Introduction

**Program Units:** The present general shape of the program had taken form by 1976 and program organization, with minor experimental thrusts, had stabilized. The currently used phraseology "program units" was first introduced in 1980 as a result of a planning activity. Program Units are elements of the total Sea Grant Program in which research, education and extension resources are brought to bear upon common goals. Program units thus represent subdivisions of the total activities of the Institute and represent its planning unit--yet like all such taxonomies, there is a degree of artificiality. For, while objectives may be set and goals stated, it is in the end, the ideas of individuals surfacing in unplanned ways that shape the program. Opportunism, we feel, must not be abandoned for the sake of the tidiness of structural dogmatism.

**Program Unit Leadership:** Many Sea Grant programs have subdivisions similar to our program units; and some programs have identified leaders for those sub-units. We in New York have experimented, over the years, with such leadership but have failed to find an appropriate mechanism. In part the multiple campus arrangement of New York Sea Grant defeats interests of this sort: Costs of maintaining leadership where travel and time must be dedicated to it are too great for good faculty to participate. Rather, we have come to utilize our Program Advisors, a broadly based group of faculty representing various disciplines and geographic locales, latterly enriched through the ex officio participation of Sea Grant Professors, as a leadership mechanism. The wisdom of the Program Advisors is implemented through the mechanism of the assistant directors for program and their close and continuing contact with principal investigators. As is the case in all New York Sea Grant activities, extension is a key player in research program development.

Our program's subdivisions have always been multidisciplinary and multifunctional. Research, extension and education have been contributors towards common goals. The interdisciplinary and multidisciplinary character of the Program Units is well displayed in some of the accompanying tabulations.

**Research Program Evolution:** New York Sea Grant's research program has gone through a variety of stages in the 13 years covered in this summary. Early phases emphasized institutional development while most recently there has been a considerable focussing of resources. Presenting a composite view of this varied milieu is difficult. To accomplish it, we have undertaken judicious revisionism, hindcasting the program into an artificial taxonomy created only for the purposes of this review. Table R1 lists these artificial "program elements." They are a representative selection of program activities through our program's history. Following each element is the acronym by which it will be identified elsewhere. To assist in understanding how this revision affects reality, as represented by the program descriptors used in the past 13 years, a list of those descriptors (through 1980) and Program Units (1981 onwards) is presented in the following Blue Pages. How projects in those descriptors were assigned to Program Elements is indicated by appropriate acronyms. Table R2 shows the numbers of projects in each Program Element by grant year.

# Program Descriptors Used by New York Sea Grant Through Time

Program Elements	Assigned Element for Recertification Purposes
<u>1971-72</u>	
Marine Environmental Quality	PPS/WQ
Coastal Utilization and Management	CZS/SSP/WQ
Resource Development	A/DCR/F/PPS
Education	ED
Advisory Services	AS
Program Management	PM
<u>1972/73</u>	
Coastal Zone Studies	
Power Plant Siting on Lake Ontario	PPS
Wetlands Management	W
Socio-Economic, Organizational and Legal Factors in Water Resource Management	E/CZS
Recreation	R&T
Coastal Processes	SSP
Other	CZS/DCR
Resources: Their Evaluation, Development and Management	
Non-living Resources	CZS
Fishery Management and Development	F/GLF
Utilization of Marine Weeds	A
Aquaculture	A/SFT
Education	ED
Advisory Services	AS
Program Management and Development	PM
<u>1973-74</u>	
Coastal Zone Planning	CZS/W
Power Plant Siting on Lake Ontario	PPS/DCR
Resource Management	E/F/GLF/R&T/SSP/W
Marine Products and Technology	A/SFT
Education	ED
Advisory Services	AS
Program Management and Development	PM
<u>1974-75</u>	
Developing an Awareness of and Plans for the Coastal Zone	
Assisting the State in Developing	
Coastal Zone Plans	CZS
Coastal Aesthetics	CZS
Describing the Coastal Region	DCR
Assisting the State in Utilizing and Managing Coastal Resources	
The Living Resources	F/W
The Non-living Resources	E/PPS
Coastal Processes	SSP
Development of Coastal Recreation	R&T
Assisting Marine Industries	



Marine Products and Technology  
 Aquaculture  
 Education and Training Program  
 Advisory Services  
 Program Management and Development

ED/SFT  
 A  
 ED  
 AS  
 PM

1975-76

Food, Products and Marketing  
 Coastal and Resource Management Policy Studies  
 Public Health and Marine Pathology  
 New Research Development  
 Education and Training  
 Advisory Service  
 Program Management and Development

A/F/SFT  
 CZS/DCR/PS/R&T/SSP  
 A  
 AM/R&T  
 ED  
 AS  
 PM

1976-77

Managing Physical Resources  
   New York Harbor Sand Resource Management  
   Dredge Spoil Management  
   Controlling Erosion Damage on  
     the Great Lakes  
   Using Wasted Products  
 Managing Living Resources  
   Hard Clam Management  
   Shellfish Pathology  
 Aiding Coastal Decision Makers  
   Effective Coastal Zone Management Strategies  
   Recreational Development Decisions  
   Economic Impact of Energy Decisions  
 Education and Training  
 Advisory Service  
 Program Management

AM  
 AM/SSP  
  
 SSP/R&T  
 A/SFT  
  
 F  
 A  
  
 CZS  
 R&T  
 E  
 ED  
 AS  
 PM

1977-78

Towards Managing Physical Resources  
   Oil and Gas  
   Sand and Gravel  
   Dredging and Dredge Spoil Disposal  
   Coastal Erosion and Stabilization  
 Towards Managing Living Resources  
   Fisheries  
   Aquaculture  
 Industrial Development Activities  
   Food Processors  
   Ports and Harbors  
   Recreation  
 Aiding Coastal Decision Makers  
 Program Activities  
   Education and Training  
   Advisory Service  
   Projects in Support of Advisory Service  
 Program Management

E  
 AM  
 AM/CZS  
 SSP  
  
 A/F/PS  
 A  
  
 SFT  
 CZS/SSP  
 R&T  
 CZS/GSB/PS  
  
 ED  
 AS  
 SSP/ED  
 PM



1979

Towards Managing Physical Resources	
Oil and Gas	E
Sand and Gravel	AM
Dredging and Spoil Disposal	AM/CZS
Coastal Erosion and Stabilization	SSP
Towards Managing Living Resources	
The Shellfishery	A/F
The Finfishery	F/GLF
Aquaculture	A
Industrial Development Activities	
Seafood Processing	SFT
Ports and Harbors	CZS/R&T/SSP
Recreation and Tourism	R&T/PS
Contaminants	WQ
Aiding Coastal Decision-Makers	PS
Advisory Service	AS
Projects in Support of Advisory Service	AS
Education	
K-12 Education	ED
Higher Education	ED
Program Management	PM

1980

Towards Managing Physical Resources	
Sand and Gravel	AM
Coastal Erosion and Stabilization	SSP
Towards Managing Living Resources	
The Shellfishery	F
The Great South Bay Study	GSB
The Finfishery	F
Coastal Development Activities	
Aquaculture	A
Seafood Technology and Utilization	SFT
Ports and Harbors	SSP/R&T
Recreation and Tourism	R&T/F/GLF
Aiding Coastal Decision-Making	PS
Contaminants	WQ/A
Extension	AS
Projects in Support of Extension Activities	SSP/ED
Education	
K-12 Education	ED
Higher Education	ED
International Project	I
Program Management	PM

1981

Aggregate Mining and Spoil Disposal	AM
Shore Structures and Processes	SSP
Recreation and Tourism	R&T
Great Lakes Sport Fishery	GLF/A
The Great South Bay Study	GSB
The Fisheries	F/R&T
Seafood Technology	SFT



Coastal Energy  
Outreach Activities  
Program Support

E  
ED/AS/PM  
ED/PS/PM

1982

Energy and Chemicals  
Aquaculture  
Great South Bay Study  
Commercial Fishery  
Seafood Technology  
Sportfishery  
Recreation and Tourism  
Spoil and Waste Disposal  
Shore Structures and Processes  
Programwide Activities

A/E  
A  
GSB  
F  
SFT  
GLF/F  
R&T/PS  
AM  
SSP  
PS/AS/ED/PM

1983

Aquaculture  
Seafood Science and Marketing  
Energy and Chemicals  
Marine Resources  
Great Lakes Resources  
Behavior and Modification of Natural Systems  
Residuals Management  
Advisory Services  
Programwide Activities

A/F  
SFT  
E/A  
F/R&T/ED  
GLF  
SSP  
WQ  
AS/ED  
PS/ED/PM

1984

Seafood Science and Utilization  
Aquaculture  
Energy and Chemicals  
Marine Resources  
Great Lakes Resources  
Behavior and Modification of Natural Systems  
Residuals Management  
Great South Bay Study  
Advisory Services  
Programwide Activities

SFT  
A  
E/A  
F/PS  
GLF/PM/R&T  
SSP  
WQ  
GSB  
AS/ED  
PS/ED/PM

Table R1. List of Program Elements Used in Recertification Tables

Advisory Services/Extension	(AS)
Aggregate Mining	(AM)
Aquaculture and Natural Products	(A)
Coastal Zone Studies	(CZS)
Describing the Coastal Region	(DCR)
Education	(ED)
Energy	(E)
Fisheries	(F)
Great South Bay Study	(GSB)
Power Plant Siting on Lake Ontario	(PPS)
Program Management	(PM)
Program Support	(PS)
Recreation and Tourism	(RT)
Seafood Technology and Marketing	(SFT)
Shore Structures and Processes	(SSP)
Spoil Disposal	(SD)
Sportfishery	(SF)
Water Quality	(WQ)
Wetlands Conservation and Management	(W)



# Research: Introduction

Table R2. Numbers of Research Projects Distributed by Program Element and Grant Year

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Advisory Services/Extension	1	1	1	2	1	1	2	4	2	3	3	2	3
Aggregate Mining	-	-	-	-	1	3	5	3	4	3	-	-	-
Aquaculture and Natural Products	1	3	3	3	3	4	5	3	2	1	2	9	8
Coastal Zone Studies	1	8	3	5	5	5	7	3	1	-	-	1	-
Describing the Coastal Region	1	2	2	2	1	-	-	-	-	-	-	-	-
Education	2	2	3	5	5	5	8	6	5	4	4	2	3
Energy	-	-	1	1	-	1	2	-	1	3	4	3	2
Fisheries	1	2	2	1	1	2	4	6	10	5	3	3	2
Great South Bay Study	-	-	-	-	-	-	2	-	3	9	1	1	-
Power Plant Siting on L. Ontario	7	3	8	1	-	-	-	-	-	-	-	-	-
Program Management	1	3	2	3	3	3	3	3	4	4	3	3	2
Program Support	-	-	-	-	1	1	1	3	4	1	2	2	1
Recreation and Tourism	-	1	1	4	3	4	2	4	4	3	3	-	2
Seafood Technology and Marketing	-	1	2	3	4	5	5	5	4	4	4	6	4
Shore Structures and Processes	1	2	2	-	2	5	6	3	6	5	6	3	2
Spoil Disposal	-	-	-	-	1	1	1	-	-	2	2	-	-
Sportfishery	-	1	1	2	1	-	-	2	3	4	4	5	3
Water Quality	10	-	-	-	2	-	-	4	2	-	-	6	3
Wetlands Conservation and Mgmt.	-	3	3	2	-	-	-	-	-	-	-	-	-

**Program Summaries:** For each of the recertification program elements there is a summary chart. On this is presented the sequence of projects carried out and a variety of analytical data such as numbers of participating faculty and their disciplines, student involvement, proportion of program devoted to the program element, and products resulting from the investment. Additional tables record full project titles, Sea Grant Scholars and thesis titles, first occupations of those Scholars, and journal articles resulting from the research. These are Tables R3 - R82.

**Definitions and Boundary Conditions for Program Summaries:** Projects are shown by project number only for those years in which funds were awarded. No-cost continuations are not shown. Mini-Grants and developmental grants are not shown. End points are marked by "C" (completed) or "T" (terminated) as appropriate except where the project was funded for a single year. Multiple project numbers reflect minor title changes and program reorganization--and bookkeeping errors. Titles are abbreviated--see full title and project funding in accompanying listing.

Pass-thru, supplemental and non-federally supported projects are included.

Faculty participants are those listed as principal investigators or co-principal investigators in proposals. The faculty participation listed is therefore conservative. Disciplines are indicated by the following acronyms:

Administration	ADM	Geology	GEOL
Anthropology	ANTH	Landscape Architecture	LA
Atmospheric Science	ATMS	Law	LAW
Biology	BIOL	Medicine	MED
Business Admin.	BA	Naval Architecture	NA
Chemistry	CHEM	Nutrition	N
Economics	ECON	Oceanography, Physical	PO
Education	ED	Chemical	CO
Engineering, Civil	CENG	Biological	BO
Mechanical	MENG	Geological	GO
Environmental	ENVENG	Physics	PHYS
Electrical	EENG	Planning	PLAN
Materials	MSENG	Political Science	PO
Extension	EXT	Public Administration	PA
Fisheries	F	Recreation	REC
Food Science	FS	Sociology	SOC
Forestry	FOR	Teaching	T
Geography	GEOG	Veterinary Medicine	VET

Publications and other products (both research and extension) are recorded for the year in which they appeared, usually lagging the project by a year in the tabulation. Data for 1972 through 1978 may be erroneously recorded because of non-calendar grant year.

Extension effort is recorded by EMIS year from EMIS reports--these data are not coincident with grant year and have been roughly fitted.

Participating students is recorded as a head count of funded Scholars. A student is thus tallied in each year support was received. Theses are recorded for year received. Student numbers should exceed theses tallied, therefore, by 2+ to 1. See Education section for precise tally.

Table R3. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Developing a Sand & Gravel Mgt Program					R/M-18								
Sand & Gravel Resources, NY Harbor						R/S-7 -----C							
Effects of Bathymetric Change						R/S-8 -----C							
Availability and Costs of Aggregate						R/S-9 -----C							
Evaluation of Changes in Wave Regime							R/S-10 -----C						
Biological Impacts of Sand Mining							R/S-11						
Combining Mining and Spoil Disposal							R/S-12						
Faunal Surveys of Mining Sites									R/S-13 -----C				
Containment of Spoils in Mined Pits									R/S-14 -----C				
Simulation of Mining in NY Harbor									R/S-15 -----C				



	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	-	-	-	-	-	1	2	1	1	0	-	-	-
Percentage of pledged match	-	-	-	-	2	5	7	2	6	4	-	-	-
Percentage of total projects in year	-	-	-	-	3	8	9	6	7	6	-	-	-
Number of participating faculty	-	-	-	-	1	3	5	5	4	3	-	-	-
Disciplines of participating faculty	-	-	-	-	PO	PO GEOL. PA	PO GEOL. BIOL. PA	PO GO BIOL. PA	GO BIOL. PA ADM	GEOL. BIOL. ADM	-	-	-
Research Publications - Articles	-	-	-	-	-	-	-	-	1	1	-	-	-
Reports	-	-	-	-	-	-	4	5	-	2	-	-	-
Popular	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	1	-	-	1	-	-	-	-	-
Extension Effort-FTE - Marine	-	-	-	-	-	-	0.1	0.1	0.1	0.1	-	-	-
Great Lakes	-	-	-	-	-	-	-	-	-	-	-	-	-
Extension Outreach - Publications	-	-	-	-	-	-	-	-	-	-	-	-	-
Information Pieces	-	-	-	-	-	-	-	-	-	-	-	-	-
Audio-Visual	-	-	-	-	-	-	-	-	-	-	-	-	-
Newsletter	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Participating Students	-	-	-	-	2	4	6	2	-	-	-	-	-
Theses Produced	-	-	-	-	-	-	3	-	-	-	-	-	-

## Research: Aggregate Mining

### Program Element: Aggregate Mining

**What:** Information needed to re-establish fill and aggregate mining operations in Lower New York Harbor. **Why:** The Sea Grant Institute was asked to develop a research program answering environmental policy questions which had caused termination of the mining program. **Outcome:** New York State is developing a long-range program for fill and aggregate mining in the Lower New York Harbor. Uncertainties of demand and regulatory environment have caused industry to be cautious about moving into offshore mining despite a favorable economic potential.

- o Sea Grant sponsored research addressing environmental impacts of underwater sand mining and the economics of shifting from terrestrial to offshore sources for construction aggregate having regional, possibly national, significance.

- o The information generated is being used by New York State in the development of a long-range mining program for the Lower Bay.

- o A synthesis of sand and gravel mining research, sponsored by the National Sea Grant Program, is being prepared.

- o When industry believes offshore mining to be attractive, a regional or national conference will be convened by New York Sea Grant. The National Sand and Gravel Association is collaborating.

- o A novel concept of utilizing holes created by mining for the disposal of contaminated dredge spoils is being explored at a demonstration project scale.

Nationwide, sources of sand and gravel for fill and for construction aggregate are being foreclosed by development. Significant resources of this mineral may lie immediately offshore of coastal cities, but these have not been exploited. Sand and gravel had historically been removed from the Lower Bay of New York Harbor to provide fill for waterfront development in the greater metropolitan area thus providing an excellent case study of the offshore mining question.

By the mid-1960's, the Lower Bay of New York Harbor was the largest source of commercial sand (for fill) to the region. Prior to 1966, very few restrictions were imposed on mining operations in the Bay, but in that year the NYS Department of Environmental Conservation (DEC), with regulatory authority over mining, prepared a draft policy restricting mining in the Lower Bay to a portion of the West Bank of Ambrose Channel, the main shipping channel into the Port of New York. Increased demand for construction aggregate in the metropolitan area and declining production from terrestrial sources on the north shore of Long Island resulted in areas on the East Bank of the Channel being opened to dredging in 1968.

The NYS Office of General Services (OGS) became concerned about curtailment of mining operations because they collect a royalty on each cubic yard removed. Peter Sanko, Sea Grant Extension Specialist, was contacted by OGS in 1973 for information on the environmental impacts of mining. The need for research was established for it was clear that until answers to the questions posed in DEC's policy statement were available, DEC's restrictive position on mining would remain unchanged. The Sea Grant Institute was asked to serve as an intermediary in the dispute because it could organize a research team and could see that results of research were used. OGS lacked the technical competency to undertake those tasks.

The DEC had issued, in its policy on underwater mining, a list of "environmental impact and resource management questions" associated with sand and gravel extraction in the Lower Bay:

1. The effect of mining on water quality, circulation, and flushing rate in the Lower Bay;
2. The effects of deepening of the West Bank on the rates of shoreline erosion on Staten Island;
3. The biological effects of sand and gravel mining operations;
4. The quantity and quality of fill and aggregate resources in the Lower Bay;
5. The rate of replenishment of the resource in the Lower Bay;
6. The effects of mining of isolated deep holes on water quality and aquatic life.

The Institute, using Program Development Funds, commenced the planning of that program. In November, 1976 the Institute, with state funds provided by a contract between the Institute and OGS, began research by geologists, biologists and oceanographers at the Marine Sciences Research Center, SUNY at Stony Brook, dealing with sand and gravel resources. With federal funds, economic studies of sources, markets and economic feasibility of a commercial mining operation for aggregate were started at the School of Management, Rensselaer Polytechnic Institute.

In May 1978, The Institute convened a meeting to present progress and to determine priorities for additional research. Participants included Marine Sciences Research Center, DEC, OGS, EPA, NMFS, NYC Planning, USF&WS, and COE. Consensus was that the sand mining research program was on target and would produce information useful in future policy decisions. A new direction for research was identified at this meeting--the coupling of sand mining with dredged material disposal through the use of old borrow pits as repositories for contaminated dredged material (See Program Element: Spoil Disposal).

From 1981 to the present, discussions have continued with OGS, DEC and other parties. Research results have been presented, briefings have been held. Extension education programs have brought research results to affected communities. As an example of how the research results have been used, a briefing based on Sea Grant sponsored research was made, at the request of OGS, to the Director, NYS Division of Budget, on sand mining operations, potential royalty structures and revenues and the potential economic relationship of sand mining and the Westway Project.

At present OGS is developing a long-term mining program and is contracting for the preparation of required state and federal environmental impact statements. The reports prepared with Sea Grant sponsorship will form the basis for that analysis.

With Dr. David Duane, National Sea Grant College Program, the Institute has considered a national conference on underwater mining. Discussions of this possibility with the National Sand and Gravel Association did not indicate that timing was appropriate. As an alternative, a report synthesizing underwater mining potentials and problems is being prepared under Institute sponsorship.



Table R4. Project Titles

R/M-18	Developing a Management Program for Offshore Sand and Gravel Mining, Marine District, New York	Schubel
R/S-7	Sand and Gravel Resources, New York Harbor: Sediment Characteristics, Distribution, and Transport	Fray
R/S-8	An Assessment of the Effects of Bathymetric Changes Associated with Sand and Gravel Mining on Circulation in the Lower Bay of New York Harbor	Wilson
R/S-9	The Impact of Offshore Sand and Gravel Mining on the Availability and Costs of Construction Minerals in Greater New York Metropolitan Area	Wallace
R/S-10	Evaluation of Changes in Wave Regime on Shore Erosion, Particularly on Staten Island, New York	Kinsman
R/S-11	An Assessment of the Biological Impacts of Sand and Gravel Mining in the Outer Bay of New York Harbor and in the Inner Bight	Carter/ Brinkhuis
R/S-12	Combining Sand and Gravel Mining with Dredged Material Disposal: An Assessment	Brinkhuis/ Bokuniewicz/ Schubel
R/S-13	Site-Specific Faunal Surveys of Potential Sand and Gravel Mining Beds in the Lower Bay, New York Harbor	Brinkhuis
R/S-14	Physical Processes Influencing the Containment of Dredged Sediment in Mined Pits in New York Harbor	Bokuniewicz
R/S-15	Computer Simulation Studies of the Lower Bay New York Harbor	Wise

Table R5. Journal Articles

Dehais, J.; Lofgren, K.; Wallace, W.  
A Decision Support for Offshore Sand Mining.  
Coastal Zone, Vol.5, 1980.  
8000

Dehais, J.; Guyette, P.; Wallace, W.  
Onshore Pressures Make Offshore Mining Viable.  
Rock Products, June 1981.  
8100

# Technical Reports

Bokuniewicz, H.J., Fray, C.T. 1979. The volume of sand and gravel resources in Lower Bay of New York Harbor. Marine Sciences Research Center (Special report 32). 34 pp.

Brinkhuis, B.H. 1980. Biological effects of sand and gravel mining in the Lower Bay of New York Harbor: An assessment from the literature. Marine Sciences Research Center, (Special report 34). 193 pp.

Carlisle, D. and Wallace, W.A. 1978. Sand and gravel in the greater New York metropolitan area: what kind and how much? (New York Sea Grant report series). 67 pp.

Courtney, K., Dehais, J., Wallace, W.A. 1979. The demand for construction minerals in the greater New York metropolitan area. (New York Sea Grant report series). 37 pp.

Dehais, J., Wallace, W.A. 1980. The Economic Viability of Offshore Mining of Mineral Aggregate in the Greater New York Metropolitan Area. Rensselaer Polytechnic Inst, School of Management. 23 pp.

Gandarillas, E.F. and Brinkhuis, B.H. 1981. Benthic faunal assemblages in the Lower Bay of New York Harbor. Marine Sciences Research Center (Special report 44). 129 pp.

Guyette, P.L. and Wallace, W.A. 1979. A cost analysis of offshore mining and dumping operations in the greater New York metropolitan area. Rensselaer Polytechnic Institute, School of Management. 72 pp.

Jones, C.R., Fray, C.T., and Schubel, J.R. 1979. Textural properties of surficial sediments of Lower Bay of New York Harbor. Marine Sciences Research Center (Special report 21). 113 pp.

Kastens, K.A., Fray, C.T., Schubel, J.R., and Wilson, R.E. 1978. Environmental effects of sand mining in the Lower Bay of New York Harbor, phase I:..., Marine Sciences Research Center (Special report 14). 139 pp.

Kinsman, B., Schubel, J.R., Carroll, G.E., and Glackin-Sundell, M. 21979. A suggestion for anticipating alterations in wave action on shores consequent upon changes in water depths in harbors and coastal waters. Marine Sciences Research Center (Special report 27). 39 pp.

Swartz, S.M. and Brinkhuis, B.H. 1978. The impact of dredged holes on oxygen demand in the Lower Bay, New York Harbor. Marine Sciences Research Center. (Special report 17). 80 pp.

Wong, K.C. and Wilson, R.E. 1979. An assessment of the effects of bathymetric changes associated with sand and gravel mining on tidal circulation in the Lower Bay of New York Harbor. Marine Sciences Research Center (Special report 18). 24 pp.

Research: Aggregate Mining

Table R6. Sea Grant Scholars/Theses

Current

NONE

Graduated, Thesis Submitted

\*David Carlisle

A MODEL FOR EVALUATING THE ECONOMIC FEASIBILITY OF OFFSHORE MINING OF  
CONSTRUCTION MATERIALS  
7805

Scott Swartz

THE IMPACT OF DREDGED HOLES ON THE OXYGEN DEMAND IN THE LOWER BAY OF NEW YORK  
HARBOR  
7805

Kuo-Chin Wong

SUBTIDAL VOLUME EXCHANGE AND THE RELATIONSHIP TO ATMOSPHERIC FORCING IN GREAT  
SOUTH BAY, NY  
7805

Status Uncertain

Paul Guyette 7905

Kenneth Lofgren 7905

Did Not Graduate

\*Anthony Rutigliano 7805

\*Doctoral Candidate



Table R7. Sea Grant Scholars/First Occupation

David Carlisle

7805

Professor, Colgate Univ.

Paul Guyette

7905

Senior Financial Analyst, Xerox Corp., Rochester

Kenneth Lofgren

7905

Bell Laboratories, New Jersey

Anthony Rutigliano

7805

Administrator, IBM, Binghamton

Scott Swartz

7805

Medical Student, Univ. of Kansas

Kuo-Chuin Wong

7808

Post-doctorate, Marine Sciences Research Center, SUNY at Stony Brook

Table R8. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Exploratory Projects in Aquaculture	R/D-1	R/A-1	R/T-1	-----T									
Diseases of Shellfish			R/T-2	-----	R/A-5	R/A-8	-----C						
Disease in American Oyster									R/F-16				
Luminosity as Indicator of Vibrio									R/F-18	-----C			
Commercial Clam and Oyster Culture												R/A-17	-----
Culture in Resuspended Sediments												R/A-19	-----
Genetics of the Oyster												R/A-18	
Basic Biological Studies - Bay Scallop													R/A-24
Settling of Bay Scallop													R/A-26
T-Dependent Sex Determination - Fish												R/A-20	-----
Proprietary Rights in Coastal Resource												R/L-5	
Legal Framework for Aquaculture													R/A-25
Peconic Bay Estuarine Circulation													R/A-23
Viral Flora in Shellfish				R/T-7	R/A-6	-----C							
Antibacterial Mechanism in Clams						R/A-9		R/F-5					
Detecting Viruses in Hard Clams								R/F-4					
Bacterial & Viral Depuration of Clams								R/A-14	-----T				
Socioeconomic Impact of Depuration								R/F-9					
Culture of the Walleye								R/A-10			-----C		
Useful Derivatives from Cladophora		R/L-1	R/T-5										
Potential Uses for Marine Weeds		R/L-2											
Marine Sources of Industrial Enzymes					R/T-12	-----T							
Marine Secondary Metabolites									R/Q-17		R/E-16		
Bioconversion of Macroalgal Biomass													R/E-22
SCF Extraction of Fish Lipids												R/E-21	-----

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	3	8	5	7	7	9	5	3	1	1	2	16	16
Percentage of pledged match	-	7	7	12	10	14	17	5	1	1	2	17	19
Percentage of total projects in year	4	10	9	8	9	10	9	6	4	2	5	20	23
Number of participating faculty	1	3	5	3	3	4	5	3	2	1	2	20	17
Disciplines of participating faculty	BIOL	BIOL FOR	BIOL CHEM FS VET	BIOL VET	CHEM VET	CHEM VET	F VET	F VET EENG	F CHEM	F	FS CHEM	BIOL CHEM PO FS LAW F	BIOL CHEM PO F POL ECON LAW GEOL
Research Publications - Articles	-	-	2	-	1	2	5	4	5	4	1	5	2
Reports	-	-	2	-	1	-	-	1	-	-	-	-	-
Popular	-	-	1	-	-	1	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	1	-	-
Extension Effort-FTE - Marine	-	-	-	-	-	-	-	0.1	0.2	0.2	0.2	0.2	0.3
Great Lakes	-	-	-	-	-	-	-	-	-	-	-	-	-
Extension Outreach - Publications	-	-	-	-	-	-	-	-	-	1	-	-	-
Information Pieces	-	-	1	-	1	-	-	-	-	-	-	-	-
Audio-Visual	-	-	-	-	-	-	-	-	-	-	-	-	-
Newsletter	-	-	-	-	-	-	-	-	-	-	-	-	x
Number of Participating Students	-	-	-	4	8	5	8	5	3	1	5	10	14
Theses Produced	-	-	-	-	-	-	4	2	3	-	1	-	-



## Research: Aquaculture

### Program Element: Aquaculture and Natural Products

**What:** Sea Grant has sought, through its research, to develop aquaculture industry in New York State. Natural products useful in industrial, pharmaceutical and food industries have been identified. **Why:** Freshwater fish culture developed in New York State and shellfish culture has been practiced for over half a century, but additional investment, despite proximity to markets was not being made. Sea Grant has sought to answer the question posed by that observation. Natural products derived from aquatic sources offer industrial development opportunities. Research on treatment of waste streams from food processing plants, on seeking ways to use aquatic plants occurring as nuisances on beaches may find new uses for these unwanted materials. **Outcome:** Some specific achievements include:

- o Identification of the Sea Grant Institute as the lead for the development of a state plan for the development of aquaculture.
- o A 4-H program for hard clam culture: "Clam Club", has been started.
- o Assistance to shellfish hatcheries in reducing mortalities of young shellfish through disease control procedures.
- o Advanced culture techniques through development of optimal scheduling for maximizing personnel efficiency.
- o New awareness among state agencies of actions to foster the development of aquaculture in New York.
- o An enzyme system Laminarinase has been isolated--its industrial potential is thought to be considerable.
- o Professor Jon Clardy, recognized x-ray crystallographer, has been funded for collaborative work with Sea Grant projects in five other programs.

New York State with its enormous market for seafoods (per capita consumption in metropolitan New York is significantly above the national average) offers opportunities for aquaculture development particularly in shellfish such as the hard clam, bay scallop, oyster (all traditional crops) and for fresh-marketed salmonids and walleye, among others. Sea Grant has stimulated interest in aquaculture throughout the state in both governmental and private sectors. State government is now seeking to organize to foster aquacultural development.

Shellfish culture has been commercial on Long Island for over 70 years. Freshwater fish culture was pioneered in New York State. It was natural for New York Sea Grant to explore its role in aquaculture from the very beginning, but those early explorations were not rewarding because the academic community lacked the expertise with which to build a sound program. One exception was in aquatic pathology in which the NYS College of Veterinary Medicine at Cornell has had a long interest. One of its faculty, Dr. Louis Leibovitz, has made major contributions to the development of the field of invertebrate disease. From 1973 through 1979 Dr. Leibovitz carried out basic and applied studies of shellfish pathology, with extensive field work on Long Island assisting the shellfish hatcheries in controlling periodic die-offs. This interest, and AQUAVET, led to an NIH funded joint Cornell/Marine Biological Laboratory diagnostic center for marine organisms at the MBL where he is presently located.

Through the middle 1970's, study of viruses and bacteria in shellfish was undertaken, with state funding arranged by the Commissioner of Health, Dr. David Axelrod, who foresaw public health problems from shellfish consumption.

A component of this research was on the effectiveness of depuration. Coupled with the basic research on the depuration process conducted at the College of Veterinary Medicine was a study at SUNY at Stony Brook on the social and economic acceptability, among baymen, of depuration.

In 1982, recognizing that opportunities for aquaculture had reached a new threshold, the Institute launched a two-pronged leadership effort. Legislation was prepared which requested the Institute, and the land grant college, Cornell, to prepare a plan for the development of aquaculture. That planning process, now in its final stages, has had the effect of heightening awareness of the potential of aquaculture in all sectors of the state. This has been most marked by a legislative appropriation of \$1 million for the development of aquaculture.

At the same time, a growing cadre of scientists at SUNY at Stony Brook, offered the opportunity for expanded aquaculture research. Led by Sea Grant professor Robert Malouf, this program has moved from primarily hard clam research to the bay scallop and other species of commercial importance. Freshwater aquaculture has not developed as fully. Walleye, a highly desired species, and a prime candidate for Great Lakes culture was the subject of extensive research, but fundamental problems in technique were not solved.

New York Sea Grant has had a long interest in marine natural products. As early as its second year, research on the potential of or marine plants as a source of fibre was underway. Additional studies sought to identify the active ingredient of Cladophora which acted as a mosquito larvicide and researchers did isolate the active enzyme system Laminarinase from the crystalline style of the Surf Clam. These studies were plagued by the question: When should the research stop? In the case of the mosquito larvicide, further research has been supported by NSF. Investigations of the use of Laminarinase, which has industrial potential, ceased with Sea Grant support.

More recent are investigations of the potential of using macroalgal biomass, produced by the Marine Biomass farm, as a feedstock for fermentation to neutral solvents, investigation of the potential of supercritical fluid extraction technology to isolate fish oils, and identification of secondary metabolites from marine organisms. The latter studies are collaborative with Sea Grant researchers at the Universities of California at San Diego, Hawaii, Rhode Island and Puerto Rico.

This component of our research program, relatively small in the past is scheduled for growth. Rapidly developing faculty interest in biotechnology is identifying new opportunities. Cornell University has been designated as the New York State Center of Excellence in biotechnology. The Sea Grant Institute is collaborating with that program in the development of its marine biotechnology program.

# Research: Aquaculture

Table R9. Project Titles

R/A-9	Antibacterial Mechanisms in Clam and Oyster Hemolymph	Timoney
R/A-10	Intensive Culture of the Walleye (Percidae: <u>Stizostedion vitreum</u> )	Nickum
R/A-14	Studies on Bacterial and Viral Depuration of Clams from Great South Bay, New York	Gillespie/ Timoney
R/A-17	Demonstration of Commercial Clam and Oyster Mariculture: A Cooperative Study	Malouf
R/A-18	Genetics and Aquaculture of the American Oyster	Koehn/ Rodhouse
R/A-19	Significance to Shellfish Aquaculture of Resuspended Bottom Material	Lopez/ Malouf/ Carey/ Schubel/ Rhoades
R/A-20	Temperature-Dependent Sex Determination in Fishes	Conover
R/A-23	A Study of the Processes of Movement, Mixing, and Exchange in the Peconic-Flanders Bay Estuarine System	Carter/ Pritchard/ Partch/ Vieira
R/A-24	Growth, Reproductive Effort, and Physiologic Responses of the Bay Scallop, <u>Argopecten irradians</u>	Malouf/ Bricelj/ Cerrato
R/A-25	Social and Economic Feasibility of Alternative Legal Frameworks for Developing Aquaculture	Boyer/ Katkin/ Meidinger/ Rhodes
R/A-26	Factors Influencing Settlement, Metamorphosis, and Early Postlarval Survival of the Bay Scallop	Siddall
R/D-1	Growth and Culture of Irish Moss ( <u>Chondrus crispus</u> ) and Other Benthic Red Algae in Long Island Waters	Terry
R/E-21	Assessment of Supercritical Fluid Extraction for Recovery of Oil and Proteins from Marine Sources	Rizvi/ Kinsella
R/E-22	Bioconversion of Macroalgal Biomass ( <u>Laminaria</u> ) to Neutral Solvents	Nakas/ Schaedle Tanenbaum
R/F-4	Survey for the Detection of Viruses in the Hard Clam ( <u>Mercenaria mercenaria</u> )	Gillespie



R/F-9	The Socioeconomic Impact of Depuration on the Great South Bay Watermen	Goodman
R/F-16	Investigation of the Role of Larval American Oysters ( <u>Crassostrea virginica</u> ) as Carriers of Oyster Diseases	Elston/ Leibovitz
R/F-18	Luminous Bacteria as Indicators of Shellfish Contamination by Pathogenic <u>Vibrios</u>	Greenburg
R/L-1	Constituents of <u>Cladophora</u> Useful in the Control of Aquatic Organisms	Judd
R/L-2	Development of Potential Uses for Certain Marine Weeds	Leopold
R/L-5	Adequacy of Existing Systems for Allocation of Proprietary Rights in Coastal Resources	Boyer
R/Q-17	Halogenated Hydrocarbon and Other Metabolites from <u>Bangia atropurpurea</u>	Clardy
R/T-2	Diseases of Shellfish	Leibovitz
R/T-7	Comparative Virology: A Study of Viral Flora in Shellfish and Their Importance as Pathogens	Gillespie
R/T-12	Marine Sources of Industrial Enzymes	Shallenberger

**Research: Aquaculture**

**Table R10. Journal Articles**

**Bricelj V.; Bass A.; Lopez G.**

**Absorption & Gut Passage Time of Microalgae in a Suspension Feeder:  
An Evaluation of the (51)Cr:(14)C Twin Tracer Technique.**

**Marine Ecology-Progress Series, Vol.17, 1984.**

**8400**

**Chanley, M.; Terry, O.**

**Inexpensive Modular Habitats for Juvenile Lobsters (HOMARUS AMERICANUS).  
Aquaculture, Vol.4, September 1974.**

**7400**

**Elston, R.**

**Viruslike Particles Associated with Lesions in Larval  
Pacific Oysters.**

**Journal of Invertebrate Pathology, Vol. 33, 1979.**

**7900**

**Elston, R.**

**Functional Anatomy, Histology and Ultrastructure of the Soft  
Tissues of the Larval American Oyster, CRASSOSTREA VIRGINICA.**

**Proceedings of the National Shellfisheries Association, Vol.70, 1980.**

**8000**

**Elston, R.**

**Functional Morphology of the Coelomocytes of the Larvae  
Oysters (CRASSOSTREA VIRGINICA and CRASSOSTREA GIGAS).**

**Journal of Marine Biology Ass., Vol.60, 1980.**

**8000**

**Elston, R.**

**Ultrastructural Aspects of a Serious Disease of Hatchery  
Reared Larval Oysters, CRASSOSTREA GIGAS Thunberg.**

**Journal of Fish Diseases, Vol.4, 1980.**

**8000**

**Elston, R.**

**Discussion of Shellfish Certification Issues Aimed at  
Formulating Sensible Solutions.**

**Aquaculture Magazine, May/June 1981.**

**8100**

**Elston, R.**

**Histopathology of Oxygen Intoxication in the Juvenile Red  
Abalone, HALIOTIS RUFESCENS SWAINSON.**

**Journal of Fish Diseases, Vol 6., 1983.**

**8300**

Elston, R.; Leibovitz, L.; et al.  
Diagnosis of Vibriosis in a Commercial Oyster Hatchery  
Epizootic: Diagnosis Tools and Management Features.  
Aquaculture Magazine, Vol. 24, 1981.  
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Elston, R.; Lockwood, G.  
Pathogenesis of Vibriosis in Cultured Juvenile Red  
Abalone, *Haliotis Rufescens* Swainson.  
Journal of Fish Diseases, Vol.6, 1983.  
8300

Friedrich, W.; Greenberg, E.  
Glucose Repression of Luminescence and Luciferase in *Vibrio* Fisheri.  
Archives of Microbiology, Vol.134, 1983.  
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Greenberg, E.; et al.  
Persistence and Distribution of Marine Vibrios in the Hardshell Clam.  
Vibrios in the Environment. R. Colwell, ed., 1983.  
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Hartland, B.; Timoney, J.  
In Vivo Clearance of Enteric Bacteria from the Hemolymph  
of the Hard Clam and the American Oyster.  
Applied and Environmental Microbiology, Vol. 37, No. 3, 1979.  
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Kaplan, H.; Greenberg, E.  
Persistence and Distribution of Marine Vibrios in the  
Hardshell Clam, *MERCENARIA MERCENARIA*.  
Biol. Bull. 161, October, 1981.  
8100

Leibovitz, L.  
Shellfish Diseases.  
Marine Fisheries Review, Vol. 40, No. 3, 1978.  
7800

Leibovitz, L.  
A Study of Vibriosis at a Long Island Shellfish Hatchery.  
International Council for the Exploration of the Sea, Copenhagen,  
2 October 1978.  
7800

Leibovitz, L.; Elston, R.; et al.  
A New Disease of Larval Pacific Oysters (*CRASSOSTREA GIGAS*).  
Proceedings of the Ninth Annual Meeting, World Mariculture  
Society, Atlanta, 3 January 1978.  
7900



Research: Aquaculture

Leibovitz, L.; Meyers, R.; et al.

Necrotic Exfoliative Dermatitis of Captive Squid  
LOLIGO PEALEI.

Journal of Invertebrate Pathology, Vol.30, 1977.  
7700

Leibovitz, L.; Rebell, G.; Boucher, G.

CARYOSPORA CHELONIAE Sp. N.: A Coccidial Pathogen of  
Mariculture- Reared Green Sea Turtles (CHELONIA MYDAS ).  
Journal of Wildlife Diseases, Vol.14, 1978.

7800

Lindley, M.; Shallenberger, R.

Enzyme Hydrolysis of Malt Glucans Using Mollusc Carbohydrase  
Preparation.

Food Chemistry, Vol.2, 1977.  
7700

Lindley, M. ; Shallenberger, R.; Herbert, S.

Purification and Characterization of a Mollusc Beta (1-3)  
Glucan Hydrolase.

Food Chemistry, Vol.2, 1976.  
7600

Meyers, T.

A Reo-like Virus Isolated from Juvenile American Oysters  
(CRASSOSTERA VIRGINICA).

Journal of General Virology, Vol.43, 1979.  
7900

Meyers, T.

Experimental Pathogenicity of Reovirus 13p2 for Juvenile American Oysters  
CRASSOSTREA VIRGINICA (GMELIN) and Bluegill Fingerlings LEPOMIS MACROCHIRUS.  
Journal of Fish Diseases, Vol. 3, 1980.

8000

Meyers, T.

Endemic Diseases of Cultured Shellfish of Long Island  
(CRASSOSTREA VIRGINICA) and Hard Clams (MERCENARIA MERCENARIA).  
Aquaculture Magazine, Vol. 22, 1981.

8100

Meyers, T.

Serological and Histopathological Responses of Rainbow Trout, SALMO GAIRDNERI  
Richardson, to Experimental Infection with the 13p2 Reovirus.

Journal of Fish Diseases, Vol.6, 1983.  
8300

Meyers, T.; Hirai, K.

Morphology of a Reo-like Virus Isolated from Juvenile  
American Oysters CRASSOSTREA VIRGINICA.

Journal of General Virology, Vol. 46, 1980.  
8000

Nickum, J.  
Intensive Culture of Walleyes: The State of the Art.  
American Fisheries Society Special Publication, Vol. 11,  
1978.  
7800

Nickum, J.  
Hatchery Design for a Coolwater Species -- A Panel.  
American Fisheries Society Special Publication, Vol.11, 1978.  
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Shallenberger, R.; Searles, B.; Lewis, B.  
Laminaranase Activity in the Crystalline Style of the  
Surf Clam (SPISSULA SOLIDISSIMA).  
Separatum EXPERIENTIA, VOL.30, 1974.  
7400

Sigler, M.; Leibovitz, L.  
Acute Toxicity of Oil and Bilge Cleaners to Larval American Oysters  
(CRASSOSTREA VIRGINICA).  
Bull. Environ. Contam. Toxicol., Vol.29, 1982.  
8200

Timoney, J.; Abston, A.  
Accumulation & Elimination of ESCHERICHIA COLI and SAMONELLA  
TYPHIMURIUM by Hard Clams in an In Vitro System.  
Applied and Environmental Microbiology, May 1984.  
8400

**Research: Aquaculture**

**Table R11. Sea Grant Scholars/Theses**

**Current**

Jennifer Epp

REPRODUCTION, GROWTH, AND FECUNDITY OF THE BAY SCALLOP, ARGOPECTEN IRRADIANS

Arthur Evjen

BIVALVE MARICULTURE SUSTAINED BY TIDAL CURRENT RESUSPENDED SEDIMENTS

\*Patrick Gaffney

BIOCHEMICAL GENETICS OF GROWTH AND METABOLISM IN THE AMERICAN OYSTER;

CRASSOSTREA VIRGINICA (GMELIN)

James Gilmore

OCEANIC DISTRIBUTION & MIGRATION OF BLUEFISH (POMATOMUS SALTATRIX) ON THE  
NORTHEAST COAST OF THE UNITED STATES

Stephen Heins

SOME FACTORS OTHER THAN TEMPERATURE AFFECTING ENVIRONMENTAL SEX DETERMINATION  
IN FISHES

James Kinyon

ALLOCATION OF MARINE RESOURCES: THE CASE OF AQUACULTURE

Benjie Korol

EFFECTS OF SUSPENDED SEDIMENT ON GROWTH OF CULTURED SCALLOPS

Carrie Paige

SEDIMENT-TRAPPING EFFICIENCY OF THE FLOOR OF LONG ISLAND SOUND

Gregg Rivara

INFLUENCE OF CURRENT VELOCITY ON BEHAVIOR OF JUVENILE HARD CLAMS

David Whitely

BIOCONVERSION OF ALGAL BIOMASS TO NEUTRAL SOLVENTS

Debra Yedwabnick

EFFECTS OF SHADOWING ON GROWTH OF OYSTERS MAINTAINED IN CULTURE SYSTEMS

**Graduated, Thesis Submitted**

\*Luciano Corazza

INTENSIVE CULTURE OF THE WALLEYE: FACTORS AFFECTING THE ABILITY OF JUVENILES  
TO UTILIZE A DRY DIET

7905

\*Ralph Elston

FUNCTIONAL ANATOMY, HISTOLOGY AND ULTRASTRUCTURE OF THE LARVAL AMERICAN OYSTER

7805

\*Lee Fuiman

DESCRIPTIONS AND COMPARISONS OF NORTHEASTERN CATOSTOMID FISH LARVAE

7805

Bonnie Hartland

STUDIES ON ANTIBACTERIAL MECHANISMS IN THE AMERICAN OYSTER AND QUAHOG CLAM

7805

\*Michael Jahncke

SELECTED FACTORS INFLUENCING THE MORTALITY OF WALLEYE FRY IN INTENSIVE  
CULTURE

7905



Geraldine Kelpin

DEPURATION AND ITS IMPLICATION FOR LONG ISLAND'S HARD CLAM INDUSTRY  
8005

Laurie Kerschner

STUDIES ON A BETA-D-GLUCANASE IN MOLLUSCA  
8005

\*Theodore Meyers

DISEASES OF COMMERCIALY IMPORTANT SHELLFISH FROM LONG ISLAND  
7805

John Ringle

CHEMICAL SEPARATION OF CHANNEL CATFISH EGG MATRICES  
8212

\*Robert Swanson

THE PATHOGENESIS OF INFECTIOUS PANCREATIC NECROSIS IN ATLANTIC SALMON  
8005

Status Uncertain

\*Somnath Das 8209

Suzanne DeMond 8401

Ronald Mendrick 8406

\*Peter Petraitis 7605

Mindy L. Zoghlin 8312

Did Not Graduate

Richard Miller 7605

Ann Stone 7606

\*Doctoral Candidate

## Research: Aquaculture

Table R12. Sea Grant Scholars/First Occupation

Kaw-Shing Chow 8412	Laurie Kerschner 8005 PhD candidate, Chemistry, Cornell
Luciano Corazza 7905 Director, Intern't'l Fish. & Aquacult. Dev., Univ. Delaware	James Kinyon 8412
Somnath Das 8209 PhD Candidate, Urban/Public Affairs, Carnegie Mellon	Benjie Korol 8412
Suzanne DeMond 8401	Ronald Mendrick 8406 PhD candidate, Baldy Center, SUNY at Buffalo
Ralph Elston 7805 Research Scientist, Battelle Northwest Laboratory, Seattle, WA	Theodore Meyers 7805 Research pathologist, Oregon St. Univ.
Jennifer Epp 8412	Richard Miller 7605 Asst. Manager, McDonalds
Arthur Evjen 8408	Carrie Paige 8408
Lee Fuiman 7805 PhD Candidate, University Of Michigan	Peter Petraitis 7605 Asst. Prof. Oceanography, UC at Davis
Patrick Gaffney 8412	Gregg Rivara 8408
James Gilmore 8412	Ann Stone 7608
Bonnie Hartland 7808 PhD candidate, Veterinary Medicine, Texas A&M University	Robert Swanson 8005 Post-Doctoral, Osborn laboratories
Stephen Heins 8412	David Whitely 8408
Michael L. Jahncke 7905 PhD candidate, Food Science, Cornell	Debra Yedwabnick 8412
Geraldine Kelpin 8005 NYC Dept. Environmental Conservation	Mindy L. Zoghlin 8312 JDPHD candidate, Baldy Center, SUNY at Buffalo





# Research: Coastal Zone Studies

Table R13. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Peconic Bay Resource Study	R/U-1	R/N-1											
Coastal Management - Lake Erie		R/S-1											
Case Study in Power & Decision-Making		R/S-2											
Port-related Activities & Econ Growth		R/S-3											
Econ Impact Environ Change Lake Erie		R/S-4	R/C-3										
LI Public Opinion & Coast Management		R/S-5											
Inter-Institutional GL Management		R/C-1											
Winter Navigation on Lake Erie		R/C-6											
NYS Coastal Management		R/C-1			R/P-10								
Govt & Comm Strategies in Coastal Mgmt			R/C-2										
Urban Coastal Resources				R/C-6	R/P-12								
Inter-governmental Relation in CZ				R/C-5	R/P-11	R/P-15							
Coastal Aesthetics				R/C-7	R/P-13	R/P-16							
Physical Alterations to Marine Coast							R/M-30						
Aggregate Income & Product of Oceans							R/E-8						
National Income Accounting Seminar									R/E-9				
Public Policy - Urban Waterfront							R/P-21						
Coal Transshipment-Port of Buffalo						R/E-5	R/P-18						
Development at Port of Buffalo									R/P-23				
Waterborne Transport - Lower Lakes												R/G-4	
CZM for Local Govt - Training				E/A-2									
Coastal Zone Seminar, NYC				E/T-2									

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	2	11	9	6	5	5	10	7	1	-	-	2	-
Percentage of pledged match	-	11	10	7	8	9	7	3	0	-	-	2	-
Percentage of total projects in year	4	25	9	13	14	12	13	6	2	-	-	2	-
Number of participating faculty	1	8	7	5	5	5	9	4	2	-	-	2	-
Disciplines of participating faculty	GEOL	PA BA SOC POL BIOL GEOL ENVENG	PA BA SOC ECON LAW PLAN	PA BA LA PLAN	PA LA PLAN	PA LA PLAN CENG	PA LA PLAN CENG PO ECON	PO CENG ECON	ECON	-	-	CENG	-
Research Publications - Articles	-	-	-	2	3	1	-	-	2	-	-	-	-
Reports	-	7	4	5	5	2	2	3	3	1	-	-	-
Popular	-	-	-	1	1	1	-	-	-	-	-	-	-
Other	-	-	-	-	1	1	-	1	1	-	-	-	-
Extension Effort-FTE - Marine	-	0.3	0.5	0.2	0.7	1.2	1.1	0.5	0.6	0.6	0.6	0.6	0.6
Great Lakes	-	-	1.3	1.5	1.3	1.2	1.0	0.9	1.0	0.8	0.8	0.8	0.8
Extension Outreach - Publications	-	-	-	1	-	-	-	-	-	-	-	-	-
Information Pieces	-	-	-	2	1	1	-	1	-	-	-	1	-
Audio-Visual	-	-	-	-	-	-	-	-	1	-	-	-	-
Newsletter	-	-	X-----X	-	-	-	-	-	-	-	-	-	-
Number of Participating Students	-	-	-	3	9	5	5	3	2	-	-	-	-
Theses Produced	-	-	-	1	3	4	2	1	1	-	-	-	-

## Research: Coastal Zone Studies

### Program Element: Coastal Zone Studies

**What:** Studies in support of the coastal zone management concept were undertaken during and after the formation of the New York State Coastal Management Program. **Why:** New York State was not an "eager" participant in the coastal zone management program. Sea Grant activities stimulated interest in state participation and contributed towards the development of the state plan. **Outcome:** Sea Grant researchers contributed substantially to the development of coastal management programs in New York and other states. **Specific accomplishments:**

- o Professor Marr, a Sea Grant principal investigator, spent a sabbatical leave with the emerging New York coastal zone program developing its citizen participation program.

- o Marr was later requested (and funded) by the Office of Coastal Zone Management, NOAA, to assist Pennsylvania's coastal management program in developing citizen participation protocols.

- o Research, resulting in commercially published books, comparing various state coastal management programs, coastal erosion hazard management and issues in coastal management were useful to many states in devising their coastal management program.

- o A National Income Accounting system for determining the aggregate income and product of the coastal region was developed in collaboration with the US Department of Commerce.

- o Coastal redevelopment programs in New York City and Buffalo were commenced which have had local, regional and national impacts.

- o Completed a productive and provocative research program in the difficult subject of using coastal aesthetics in coastal management programs.

- o An inter-institutional Great Lakes management seminar carried out by Leonard Dworsky, Cornell, caused significant change in the International Joint Commission's programs of Great Lakes management. In 1983, Lee Botts commenced a reprise of this project.

New York Sea Grant anticipated coastal zone planning in the state by sponsoring a conference "Managing Our Coastal Zone" in February, 1973. Many believe that this conference was influential in leading the state towards participation in the Coastal Zone Management Program.

Participating in that conference were many principal investigators of Sea Grant's first major multi-disciplinary, multi-campus program--coastal zone studies. Our first efforts, numerous discrete projects, were seen by site visit review teams as being uncoordinated: Subsequent groupings of investigators into teams was seen as being "too complex." Through this learning process emerged the Institute's abilities to develop, manage and "sell" multi-disciplinary, multi-campus projects.

From 1972 through 1974, the multi-campus coastal zone studies group emphasized the Great Lakes region in their proposals. Few of these projects developed products of consequence as program management struggled with the problem of faculty mobility. During that period, over half the researchers involved in the coastal zone studies left the State University system. Those remaining, principally a core group at SUNY at Albany, restructured their proposals and through 1978 the research thrust was on policy issues related to the developing concept of state coastal management programs. While New York researchers were somewhat late getting into the field, these contributions, particularly the books by Professor Heikoff, were well received nationally. A

coastal aesthetics program developed at the School of Landscape Architecture, SUNY College of Environmental Science and Forestry, once reviewed as "the best among an unimpressive group" produced a substantial literature and organized highly successful and well attended workshops on coastal aesthetics, making important contributions to this subfield.

Educational activities associated with the Program Element included seminars on coastal management carried out contemporaneously with the development of the state's program. In addition to those listed here are others, support for which came from Program Development funds (see Program Development Funds).

With the termination of those groups of projects, coincident with the emergence of a state coastal management program in 1978, further organized research in coastal zone studies was not undertaken and the subject has been given a low priority by the Institute. Specific subjects, however, have remained active. Urban waterfront redevelopment research is one such area, initiated in New York City by Mitchell Moss, New York University, whose contributions to the University of Southern California Sea Grant program introduced him to us. One of the most important, and controversial, studies by Moss was a mapping of the pattern of waterfront land use in Manhattan with the resultant finding that this was some of the cheapest (in rental per square foot) land in New York City. These findings stung City administrators, stimulating them to: 1) undertake similar research to corroborate the findings; and, 2) initiate waterfront redevelopment schemes. This research, while useful, taught the Institute that findings potentially embarrassing to a client can result in alienation. Several years of rebuilding relationships with the City of New York were required. Other waterfront redevelopment research is included in the Program Element: Recreation and Tourism.

Other research related to the coastal region of the state has been classified in this Program Element. For example:

- o Guilio Pontecorvo's important contribution on an Ocean Sector Account in the National Income Accounting system. The funding for this research was matched by \$100,000 from the US Department of Commerce.

- o A series of projects on port development and waterborne transportation on the Great Lakes. This subject commands keen interest in the economically depressed Niagara Frontier. The Institute has kept Eric Schenker and his colleagues at the University of Wisconsin informed on this research. Some of the research, particularly that dealing with coal trans-shipment, was co-funded with the NYS Job Development Authority. A current research effort, on cross-lake shipping, was a joint project of the University of Toronto and SUNY at Buffalo--both funded by New York Sea Grant.

Extension programming in coastal zone studies has been more or less continuous since Sea Grant commenced. Early in the formation of the State's Coastal Management Program (CMP) there were collaborative efforts--and a lot of exploration by CMP to determine what Sea Grant was. Sea Grant's newsletter Coastlines carried a special page (in different color) prepared by the coastal management program. Extension Specialists aided communities to develop their components of the state plan. And, with subsequent funding opportunities available to local governments, there has been a continuing relationship between Sea Grant and Coastal Management. A present major activity is a collaborative effort of Sea Grant and the Department of Environmental Conservation to make the latter's coastal protection guidelines more understandable to individuals and to communities.



## Research: Coastal Zone Studies

Table R14. Project Titles

E/A-2	Coastal Zone Management Training for Local Government Officials: Basic Information and Orientation Program	Eldridge
E/T-2	Seminar on Recreational and Land Use Planning Aspects of Coastline and Shoreline Management	Friedburg
R/C-1	Inter-Institutional Management Problems on the Great Lakes	Dworsky
R/C-1	Management of the New York State Coastal Zone	Marr/ Heikoff/ Nunez
R/C-2	Governmental and Community Strategies in Planning and Managing New York's Coastal Zone	Ford
R/C-5	Intergovernmental Relations in Coastal Zone Management	Heikoff
R/C-6	Ice and Winter Navigation on Lake Erie	Stewart
R/C-6	Planning and Redevelopment of Urban Coastal Resources	Moss
R/C-7	Developing a Program in Coastal Aesthetics	Harper
R/E-5	Development of Port of Buffalo as Coal Transshipment Center	Paaswell
R/E-8	The Aggregate Income and Product of the Oceans, Phase II	Pontecorvo/ Wilkinson
R/E-9	Seminar on National Income Accounting Project	Pontecorvo/ Wilkinson
R/G-4	Prospects for Waterborne Transportation in the Lower Great Lakes	Talvitie/ Hauer
R/M-30	A Critical Assessment of the Pressures on New York's Marine Coastal Zone from Physical Alterations	Schubel
R/P-21	Public Policy for the Development of the Urban Waterfront	Moss
R/P-23	Strategies to Maximize Benefits to Development at Port of Buffalo	Paaswell/ Recker
R/S-1	Coastal Zone Management of Lake Erie in the Western New York Region: Current Status and Future Directions	Ford

Research: Coastal Zone Studies

R/S-2	Power and Decision-Making: Case Studies in Setting Ecological Priorities	Dommermuth
R/S-3	Port-Related Activities and Metropolitan Economic Growth	Crow
R/S-4	The Impact of Changes in Lake Erie upon Incomes, Land Values, Local Taxes and Employment in Chautauqua and Erie Counties 1950-1970	Starler
R/S-5	Public Opinion on the Management and Use of the Shore Zone on Long Island South Shore Bays	Collver
R/U-1	Multiply-Oriented Substrate and Water Study--Long Island Sound and Peconic Bays, Long Island, New York	Brennan

**Research: Coastal Zone Studies**

**Table R15. Journal Articles**

**Felleman, J.**

**Viewing New York's Coast: Resources, Research Issues,  
and 'Preview' a Computer Modelling Technique.**

**Proceedings of the Workshop of the Role of Vegetation in Stabilization  
of the Great Lakes Shoreline, December 1976.**

**7700**

**Fisher, W.; Starler, N.; Fisher, A.**

**Environmental Impact on Property Values Along New York  
Lake Erie Coastline.**

**Journal of Great Lakes Research, Vol. 2, No.1, July 1976.**

**7600**

**Fisher, A.; Fisher, W.; Starler, N.**

**Small Area Economic Analysis: Are Dun & Bradstreet  
the Answer?**

**Northeast Regional Science Review, Vol.5, 1975.**

**7500**

**Harper, D.**

**Focusing on Visual Quality of the Coastal Zone.**

**The Present and Future of Coasts, Proceedings of First Annual  
Conference, November 1975.**

**7500**

**Moss, M.**

**The Urban Port: A Hidden Resource for the City and the  
Coastal Zone.**

**Coastal Zone Management Journal, Vol. 2, No. 3, 1976.**

**7600**

**Moss, M.**

**Staging a Renaissance on the Waterfront.**

**New York Affairs, Vol.6, No.2, 1980.**

**8000**

**Nieman, T.; Viohl, R.**

**The Description, Classification, and Assessment of  
Visual Landscape Quality.**

**Council of Planning Librarians Exchange Bibliograph, No.1064, June 1976.**

**7600**

**Pontecorvo, G.; Wilkinson, M.; et al.**

**The Contribution of the Ocean Sector to the United States  
Economy.**

**Science, Vol. 208, May 30, 1980.**

**8000**

Table R16. Sea Grant Scholars/Theses

Current

Gerry Pfeffer  
EFFECTS OF REGULATION ON INTERNATIONAL SHIPPING IN THE LOWER GREAT LAKES

Graduated, Thesis Submitted

Radsworth Anderson  
THE SITE SELECTION AND EVALUATION PROCESS IN WATER-ORIENTED RECREATION  
PLANNING ON THE HUDSON RIVER AND ADJACENT SITES  
7605

Alan Brundage  
A PRELIMINARY ASSESSMENT OF POTENTIAL DEVELOPMENT AT THE PORT OF BUFFALO  
7905

Peter Burbridge  
THE VALUATION OF TIDAL WETLANDS AS A GUIDE TO MANAGEMENT  
7805

John Dana  
PLANNING AND DEVELOPMENT AT THE UPSTATE PORTS OF NEW YORK  
8005

William Finch  
ANALYSIS OF SELECTED MANAGEMENT PROGRAMS ON LAKE ONTARIO  
7705

Cynthia Harmon  
A SURVEY OF SELECTED LAND USE ALLOCATION METHODS AND THEIR APPLICATIONS TO  
PLANNING THE COASTAL ZONE OF NEW YORK  
7605

Debra Hoffman  
THE REVITALIZATION OF FULTON FERRY: A PROTOTYPE FOR WATERFRONT REDEVELOPMENT  
IN NEW YORK CITY  
7605

Peter Jackson  
APPLICATION AND CRITIQUE OF A SCENIC RESOURCES STUDY METHOD: ONEIDA COUNTY,  
NEW YORK  
7805

Donna Krongold  
PLANNING AND MANAGEMENT OF NEW YORK CITY'S WATERFRONT  
7505

\*Edward Lavery  
CITIZEN PARTICIPATION IN RHODE ISLAND COASTAL MANAGEMENT: A FRAMEWORK FOR  
DEFINITION  
7605

Carol Nemore  
LOCAL OFFICIALS PERSPECTIVE ON PUBLIC PARTICIPATION IN COASTAL ZONE  
MANAGEMENT  
7605

Roger Salerno  
TRANSITION IN THE URBAN BEACH COMMUNITY: A STUDY OF ROCKAWAY, NEW YORK  
7512



**Research: Coastal Zone Studies**

**Status Uncertain**

Sarah Haskett 7505  
\*Donna Knoll 7605  
Brenda Kousheshi 8005  
Margaret Ross 7505

**Did Not Graduate**

Mary Burgess 7805

\*Doctoral Candidate

Table R17. Sea Grant Scholars/First Occupation

Radsworth Anderson 7605 Planner, NYS Office of Parks and Recreation	Donna Krongold 7505 Planner, Tri-state Regional Planning Commission
Alan Brundage 7905 Bell Aerospace Corp., Buffalo, NY	Edward Laverty 7605 Prof. Political Science, Univ. Maine
Peter Burbridge 7805 Ford Foundation in Indonesia	Carol Nemore 7605
Mary Burgess 7805	Gerry Pfeffer 8412
John Dana 8005 Transportation Analyst, NYS Dept. of Transportation, Albany, NY	Margaret Ross 7505
William Finch 7705	Roger Salerno 7512 NYC Office of Management and Budget
Cynthia Harmon 7605 Administrative Analyst, NYS Dept. of Environmental Conservation, Albany, NY	Richard Viohl 7708 Recreation Planner, Onondaga County
Sarah Haskett 7505 Coastal Management Program, NYS Dept. of State, Albany, NY	
Debra Hoffman 7605 Deputy Director, NY County Local Development Corp.	
Peter Jackson 7805 Architectural Consultant, Lexington, KY	
Donna Knoll 7605	
Brenda Kousheshi 8005 Master's candidate, SUNY at Buffalo	

Research: Describing the Coastal Region

Table R18. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
A Management Model for LI Sound Magnetic Survey of the St. Lawrence New York Bight Atlas Series Environmental Atlas of Lake Ontario	R/D-4	R/C-5 R/C-10	R/M-10 R/P-9	R/C-9						C			

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	4	14	6	13	5	4	-	-	-	-	-	-	-
Percentage of pledged match	-	1	3	5	4	0	-	-	-	-	-	-	-
Percentage of total projects in year	4	6	6	6	6	2	-	-	-	-	-	-	-
Number of participating faculty	1	2	3	4	3	3	-	-	-	-	-	-	-
Disciplines of participating faculty	PHYS	CO ADM	GEOL CO PO	ATM ADM	ATM ADM	ADM	-	-	-	-	-	-	-
Research Publications - Articles	-	-	-	1	2	1	-	-	-	1	-	-	-
Reports	-	-	-	2	1	2	-	-	1	1	-	-	-
Popular	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	3	7	9	5	2	-	1	1	-	-
Extension Effort-FTE - Marine	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	-	-	-	-	-	-	-	-	-	-	-	-	-
Extension Outreach - Publications	-	-	-	-	-	-	-	-	-	-	-	-	-
Information Pieces	-	-	-	-	-	-	1	-	-	-	-	-	-
Audio-Visual	-	-	-	-	-	1	-	-	-	-	-	-	-
Newsletter	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Participating Students	-	-	1	1	1	1	1	1	-	-	-	-	-
Theses Produced	-	-	-	-	-	-	-	-	-	-	-	-	-



## Research: Describing the Coastal Region

### Program Element: Describing the Coastal Region

**What:** Production of a series of descriptive, synthetic, publications dealing with areas of New York's coastal region. **Why:** New York's coastal area had not been extensively researched--some areas were essentially "unknown" in their physical, chemical and biological characteristics. As a starting point for a new research program like Sea Grant, gathering together what information was available seemed a sound starting point. **Outcome:** Three major segments of the state's coastal region were described. Products include:

- o The MESA New York Bight Atlas Monograph Series--Twenty-eight monographic treatments of the New York Bight. Although aging, this series remains the most comprehensive source of information on the New York Bight.

- o The Urban Sea: Long Island Sound--The first product of this program element, a commercially published book, served usefully at a period of intense interest in Long Island Sound although sales did not meet expectations.

- o Environmental Atlas of Lake Ontario--Although never fully developed, this series had utility and some of its components have been used as reference works.

When the New York Sea Grant program commenced, little was known of the state's coastal region<sup>1</sup>. There had not been a history of academic interest in coastal studies--there were no consequential marine or Great Lakes laboratories in the state--and what descriptive literature existed was scattered and fragmented. A first year project calling for the development of a management model for Long Island Sound grew into an interest, among its principal investigators, in producing a book which would bring together the oceanography of the Sound and social and economic factors affecting its development. From that germ grew the concept of developing a series of products describing other coastal areas of the state.

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<sup>1</sup>A bibliography of the New York Bight prepared by the Environmental Data Service contains 2578 entries covering the natural and social sciences through 1973. Less than 3% of those entries predate 1900 and only 40% appeared before 1960. Pre-Sea Grant (i.e. pre-1970) literature constitutes only 75% of the citations given.  
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A second opportunity to prepare synthesis literature was presented with initiation of the MESA New York Bight Project. We judged this NOAA program could utilize a "quick first product", an atlas summarizing known information about the Bight. The New York Sea Grant Institute made such a proposal to the MESA program and gained necessary funds. Inexperienced in the production of such a series, we were not prepared for ingenious excuses contrived by participating authors for not delivering manuscripts and for other delays, but it was an exhilarating learning process as the proposed one-year project stretched into a decade long enterprise. The series has been widely used by governmental agencies, consulting firms and citizens groups. Its volumes are often in evidence at public hearings on coastal matters. A projected synthesis atlas was abandoned when estimated costs became too great.

A logical outgrowth of the MESA New York Bight Atlas series was a comparable production for Lake Ontario. Initially thought of as a compendium of information growing out of the Power Plant Siting research (see Program Element: Power Plant Siting on Lake Ontario), there was broad interest in synthesis of coastal environmental data. An agreement for 50% of the funding to be obtained from public utilities broke down when the state's Public

Service Commission and the utilities failed to agree to utilize the series as a common baseline of data. Private foundations contributed small sums, but never enough to realize production costs. Sea Grant tried to continue the development of the series alone but was unable to adequately fund the project to achieve a quality product. Lacking were: A strong manager to elicit manuscripts; editorial staff to assure quality of written materials; production staff for graphics; and, funds for production of good quality products.

By the time the Lake Ontario Atlas was underway, other Sea Grant programs had caught "atlas fever" and National Sea Grant Office interest in supporting these ventures was waning. We were discouraged from undertaking completion of the Lake Ontario Atlas and from other initiatives of this sort.

Important lessons were learned from these activities:

- o The concept of descriptive or synthetic atlases is sound, for if properly done, they may constitute one of the longer lasting contributions of a Sea Grant program.
- o Undertaking an atlas series requires patience and a strong editor.
- o Production costs far exceed the stipends used to encourage contributions and must be so budgeted
- o Products must be of high quality--visually and scientifically--for consumer acceptance. They must convey an "air of authenticity."
- o Descriptive volumes making information accessible to the interested public are of greatest value when produced immediately prior to, or in conjunction with, a major regional study. Concerned citizens are then eager, and primed for materials which place specific information into some broader technical context. Sea Grant, as an "uninvolved" source of information, can gain much from meeting this need for independent analysis.

New York's experience with the MESA New York Bight Atlas Monograph Series contributed significantly to the development of the Puget Sound Atlas series being produced by Washington Sea Grant. It is believed that New York's experience also contributed to other Sea Grant program's efforts of this sort.

Areas of New York which should be the subject of descriptive treatment of this sort, listed in decreasing order of priority, include: the Peconic and Gardiners Bays, eastern Lake Erie and the Hudson River. A Great South Bay, Long Island, synthesis volume is being prepared as a final product of the Great South Bay study (see Program Element: Great South Bay).

## Research: Describing the Coastal Region

Table R19. Project Titles

R/C-9	An Environmental Atlas of Lake Ontario	Stewart
R/C-10	New York Bight Environmental Atlas Series	Squires/ Hopkins/ Ginter
R/D-4	Development of a Management Model for the West End of Long Island Sound	Weyl
R/P-9	A Detailed, Precision Magnetic Survey of a Portion of the St. Lawrence River	Revetta

Table R20. Journal Articles

Bowman, M.

Tidal Locks Across the East River: An Engineering Solution to the Rehabilitation of Western Long Island Sound.

Estuarine Processes, Vol.1: Uses, Stresses, and Adaptation to the Estuary, 1976.

7600

Bowman, M.

The Hydrodynamic Characteristics of the East River Tidal Strait, New York.

Memories Societe Royale des Sciences de Liege, tome X, 1976.

7600

Bowman, M.

Nutrient Distributions and Transport in Long Island Sound.

Estuarine and Coastal Marine Science, Vol.5, 1977.

7700

Bowman, M.

Pollution Prediction Model of Long Island Sound.

Proceedings of the Specialty Conference on Civil Engineering in the Oceans III, 9 June 1975.

7500

Table R21. Sea Grant Scholars/Theses

Current

NONE

Graduated, Thesis Submitted

NONE

Thesis Other than Sea Grant

\*Michael Holdowsky 7905

Status Uncertain

Jonathan Kanter 7705  
\*Carol St.James 7505

\*Doctoral Candidate

Table R22. Sea Grant Scholars/First Occupation

Michael Holdowsky  
7905  
Instructor, Columbia Univ.

Jonathan Kanter  
7705  
Planner, Essex County Planning Board

Carol St.James  
7505  
PhD candidate, Case Western Univ.



Table R23. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Economic Implications of OCS Develop			R/M-9										
Alternative Leasing Strategies - OCS				R/M-11									
Econ Eval OCS Policy Options					R/E-3	-----C							
Oil Spill Potential - Atlantic OCS						R/E-7	-----T						
Marine Biomass Studies								R/E-9	R/E-12	R/E-17			
Carbohydrate Comp. of NYS Seaweeds											R/E-14	-----T	
Nitrogen Depletion in Fucus												R/E-20	
Formation of Hanging Ice Dams										R/E-11	-----C		
Hydraulics of Hanging Ice Dams												R/E-18	
Coal Waste Blocks-Artificial Reefs						R/E-12							
Coal Waste Blocks for GL Reefs										R/E-10			

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	-	-	2	2	-	1	1	-	1	2	2	1	1
Percentage of pledged match	-	-	1	1	-	2	1	-	0	2	29	19	5
Percentage of total projects in year	-	-	3	3	-	3	4	-	2	6	10	7	6
Number of participating faculty	-	-	1	1	-	1	2	-	1	8	7	6	2
Disciplines of participating faculty	-	-	ECON	ECON	-	ECON	ECON GEOL	-	BIOL	BIOL MSENG PLAN GEOL CENG CHEM ADM	BIOL MSENG GEOL CENG CHEM ADM	MSENG CENG BIOL ADM	BIOL CENG MSENG ADM
Research Publications - Articles	-	-	-	2	1	-	-	-	1	3	1	4	3
Reports	-	-	2	2	-	-	-	-	-	1	1	2	-
Popular	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-
Extension Effort-FTE - Marine	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Extension Outreach - Publications	-	-	-	-	-	-	-	-	2	-	-	-	1
Information Pieces	-	1	1	-	-	-	-	-	-	-	-	-	-
Audio-Visual	-	-	-	-	-	-	-	-	-	-	-	-	-
Newsletter	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Participating Students	-	-	-	1	1	-	-	-	1	5	8	10	8
Theses Produced	-	-	-	-	1	-	-	-	-	1	1	2	2

Program Element: Energy

**What:** Four areas of energy research have been explored by New York Sea Grant: OCS oil and gas development; disposal of ash and scrubber wastes from coal-burning steam-electric generating plants; production of marine biomass for digestion to synthetic methane; and reduction of head loss in hydroelectric plants caused by hanging ice dams. **Why:** Energy is a critical issue in the northeast which is dependent upon imported energy sources. Novel sources and increased production efficiencies are needed. **Outcome:** Sea Grant research has:

- o Contributed to shaping national policy on leasing of OCS oil and gas tracts;
- o Stimulated development of a novel method for disposal of ash and scrubber sludge from fossil fuel electric generating plants which is now being used.
- o Commenced a longer term program in the utilization of macroalgal biomass for energy or chemical production.
- o Contributed to basic understandings of riverine ice formation and behavior.

Outer Continental Shelf studies began as one faculty member's interest in economics and leasing policy. A later attempt at broadening the program to include geological hazards involved in east coast shelf-edge drilling did not develop although some research was started. OCS studies were then ended. Studies of leasing policy were, however, highly productive. As a result of the substantial number of working papers, journal articles and books prepared by Professor Robert Kalter on leasing economics and his econometric model, he quickly attained national recognition in this subject. Kalter was invited to serve as Director, Office of Leasing Policy, US Department of Energy and took a two-year leave from Cornell for this purpose. While with the Department of Energy, he developed national policy on OCS leasing and drafted the legislation which now defines leasing policies and options.

Beneficial use of wastes from the burning of coal by electric generating plants was investigated in a Program Development grant to Professor Duedall, SUNY at Stony Brook, who conceived of compressing a mix of fly ash, stack exhaust scrubber sludge, ash and other materials into blocks. With the developmental funding, Duedall constructed a number of such blocks and placed them in the seawater environment, finding that they had structural stability and did not leach toxics to seawater. This "high risk" project was successful for with the data and experience gained, the project was greatly expanded with state and federal energy funding. A large scale demonstration of the feasibility of constructing an artificial reef with coal waste/scrubber sludge blocks has been carried out in a reef constructed off Fire Island. Over \$3.5 million in other funds have supported the conclusion of this project.

Additionally this disposal option was studied by the Sea Grant Coastal Law Program and found not to contravene federal ocean dumping law. [See Program Element: Program Support] The research has since been extended, with Sea Grant support, to the Great Lakes in a cooperative activity of SUC at Oswego and SUNY at Stony Brook involving chemists, biologists and geologists. Sea Grant funds have been matched by funding from state and national electrical power generating research organizations. A major public utility in Wisconsin has filed for permission to use coal waste blocks in a Lake Michigan artificial reef.

The New York Marine Biomass Project is capsulated in Blue Pages which follow. This program is the northeastern portion of the national marine biomass program and was directed towards the demonstration of farming of marine biomass. Little known indigenous species of macroalgae were selected for the New York research because exotic, better known species could not be introduced. Research required a mix of basic biological science with applied culture technology. The latter was greatly assisted through the knowledge gained from Chinese culturists. A senior Chinese scholar brought to the New York project resulted in major technical advances--and in the development of the Sea Grant Institute's Post-Doctoral Fellow Program. An integrated farm design activity requiring close collaboration of biologists and engineers was also necessary for this project. The absence of this kind of collaboration had been a weak point in west coast marine biomass projects.

Once again, it has been shown that while such cross-disciplinary collaboration is possible, it rarely occurs without considerable suasion. Insistence on interaction between biology and engineering in this project was a major contribution of the Institute staff. The Marine Biomass Program has achieved its immediate goal of demonstrating the feasibility of farming macroalgae. While there is question if synthetic gas can be competitively produced from marine biomass, there are other potentials. Macroalgal biomass may serve as a source of chemicals, or other uses--these are now being examined in other Sea Grant research [see Program Element: Aquaculture and Natural Products].

New York's investment, with Canada, in major hydroelectric works as a part of the St. Lawrence Seaway construction, have turned out to be wise. These major facilities are the only indigenous sources of energy in the northeast. However, because of ice formation upstream of the hydroelectric dams there is a loss of up to 10% of potential power generation through head-reduction. Management of hanging ice dams to minimize head-loss becomes economically significant in cold regions. The St. Lawrence Seaway Corporation asked that the Sea Grant Institute support the basic research on ice dam formation which the Seaway Corporation could not, while the Seaway Corporation would fund the field work and data collection. The result has been a harmony of field and basic research leading to understandings which will allow fuller delivery of the hydroelectric potential of colder regions.



**Research: Energy**

**Table R24. Project Titles**

R/E-3	An Economic Evaluation of Policy Options Directed Toward Enhanced Energy Recovery from the Outer Continental Shelf	Kalter
R/E-7	Oil Spill Potential and the Prediction of Abnormally High Subsurface Pressures on the Atlantic Outer Continental Shelf	Travers
R/E-9	Marine Biomass Studies	Terry/ Brinkhuis
R/E-10	Assessment of Suitability of Coal Waste Blocks for Artificial Reefs in Lake Ontario	Scrudato/ Gannon
R/E-11	Formation of Hanging Ice Dams	Shen
R/E-12	Environmental Effects of Power Plant Calcium Sulfate/Sulfite and Fly Ash in Sea Water	Duedall
R/E-14	The Carbohydrate Composition of Selected Seaweeds Indigenous to New York Coastal Waters	Lewis
R/E-18	Hydraulics of Hanging Ice Dams	Shen
R/E-20	Physiological Aspects of Nitrogen Depletion in <u>Fucus vesiculosus</u> : Practical Applications for Seaweed Mariculture	Brinkhuis/ Kramer
R/M-9	Economic Implications of Potential Atlantic Outer Continental Shelf Oil and Gas Resources to New York State	Kalter
R/M-11	Evaluation of Alternative Energy Leasing Strategies and Schedules for the Outer Continental Shelf	Kalter

Table R25. Journal Articles

Breslin, V.; Duedall, I.

The Behavior of Fly-Ash Derived Arsenic in Seawater.  
Marine Chemistry, Vol. 13, 1983.

8300

Duedall, I.; Roethell, F.; et al.

Stabilized Power Plant Scrubber Sludge and Fly Ash in the Marine Environment.  
Ocean Dumping of Industrial Wastes, B. Ketchum. D. Kester and  
P. Parks, eds., 1981.

8100

Duedall, I.; Bowman, M.; O'Connors, H.

Sewage Sludge and Ammonium Concentrations in New York Bight Apex.  
Estuarine and Coastal Marine Science, Vol.3, 1975.

7500

Duedall, I.; Roethal, F.; et al.

Physical and Chemical Behavior and Environmental Acceptability of Stabilized  
Scrubber Sludge and Fly Ash in Seawater.  
Ecological Assessments of Effluent Impacts on Communities of Indigenous  
Aquatic Organisms. J. Bates, ed., 1981.

8100

Halabi, Y.; Shen, H.; et al.

A Two Dimensional Numerical Model for Mixing in Natural Rivers.  
Computational Methods and Experimental Measurements. Proceedings of the  
International Conference, Washington, D.C., July, 1982.

8200

Hallabi, Y.; Shen, H.

A Two-Dimensional Collocation Finite-Element Model for Transient Mixing in  
Natural Rivers.

Computational Methods and Experimental Measurements, Proceedings of the  
International Conference, Washington, D.C., July 1982.

8100

Kalter, R.; Tyner, W.

Disposal Policy for Energy Resources in the Public Domain.  
Energy Supply and Government Policy, 1976.

7600

Kalter, R.; Stevens, T.; Bloom, O.

The Economics of Outer Continental Shelf Leasing.  
American Journal of Agricultural Economics, Vol. 57, No. 2, 1975.

7500

Roethal, F.; Duedall, I.; et al.

The Interactions of Stabilized Scrubber Sludge and Fly-Ash with the Marine  
Environment.

Journal of Testing and Evaluation, Vol.8, No.5, September 1980.

8000

**Research: Energy**

**Shen, H.**

**Hydraulic Resistance of River Ice.**

**Proceedings of the Conference on Frontiers in Hydraulic Engineering,  
Cambridge, MA., 9 August 1983.**

**8300**

**Shen, H.T.; Foltyn, E.; Daly, S.**

**St. Lawrence River Freeze-Up Forecast.**

**Proceedings of the Cold Regions Engineering Specialty Conference, Canadian  
Society for Civil Eng., Montreal, Quebec, 4 April 1984.**

**8400**

Table R26. Sea Grant Scholars/Theses

Current

Chin Ho  
HYDRAULICS OF HANGING ICE DAMS  
\*Sergio Andrade  
FIRST-ORDER ANALYTICAL GROWTH MODEL OF LAMINARIA SACCHARINA WITH REALISTIC  
DEPENDENCE ON SEASONAL FACTORS  
Ik Kyo Chung  
THE UPTAKE AND LOCALIZATION OF COPPER IN THE MARINE BROWN ALGA, LAMINARIA  
SACCHARINA  
\*Jin Ae Lee  
REPRODUCTIVE PHEROLOGY OF LAMINERIA SACCHARINA AT ITS SOUTHERN LIM IT OF  
DISTRIBUTION IN THE WESTERN ATLANTIC OCEAN  
Seth Yarish  
MARINE BIOMASS PROJECT  
Jose Zertuche  
MARINE BIOMASS PROJECT

Graduated, Thesis Submitted

Li-Ann Chiang  
A NUMERICAL MODEL FOR THE ST. LAWRENCE RIVER THERMAL-ICE REGIME  
8112  
Lucinda Hwang  
EFFECTS OF SEAWATER NITRATE CONCENTRATION ON THE ACCUMULATION OF AMINO ACIDS  
IN GRACILARIA TIKVAHIAE  
8408  
Jonathan Kramer  
SEASONAL ASPECTS OF CARBON METABOLISM IN FUCUS VESICULOSIS  
8309  
Gary Pasquarell  
HYDRAULIC ROUGHNESS OF THE ST. LAWRENCE RIVER ICE COVER  
8305  
Cornelia Schlenk  
CHARACTERISTICS OF LAMINARIA SACCHARINA CULTIVATED IN LONG ISLAND SOUND,  
NEW YORK  
8305  
James Seligman  
CHEMICAL AND PHYSICAL BEHAVIOR OF STABILIZED SCRUBBER WASTES AND FLY ASH IN  
SEAWATER  
7605  
William VandeValk  
FIELD INVESTIGATION OF A HANGING ICE DAM IN THE ST. LAWRENCE RIVER  
8208

Status Uncertain

\*Doctoral Candidate

George Flynn 8308  
\*Edward Foltyn 8401  
Lucinda Hwang 8405



**Research: Energy**

**Table R27. Sea Grant Scholars/First Occupation**

**Chin Ho**  
**8412**

**Li-Ann Chiang**  
**8112**  
**Hydraulic Engineer, Taiwanese Water Resources Planning Comm.**

**George Flynn**  
**8308**  
**Industrial Hygenist, OSHA, Billings, MT**

**Edward Foltyn**  
**8401**  
**Research Hydraulic Engineer, US Army Cold Regions Res. Lab**

**Gary Pasquarell**  
**8305**  
**PhD Candidate, Engineering, Clarkson Univ.**

**James Seligman**  
**7605**

**William VanDeValk**  
**8208**  
**Hydraulic Engineer, Stone and Webster, Inc., Boston**



Table R28. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Planktonic Fish Eggs-Peconic Bay	R/D-5						R/F-28						
Yellow Tailed Flounder Stocks													
Population Data for Spiny Dogfish								R/F-10	-----C				
Increases in Sand Lance												R/M-41	
Abund & Dist of Fish Stocks													R/M-48
Hard Clam Industry & Resource					R/M-24	R/A-7	R/F-6						
Population Dynamics of Hard Clams						R/A-11							
Population Dynamics GSB Shellfishery							R/F-7	-----		R/F-22	-----C		
Juvenile Bay Scallops and Eelgrass													R/M-47
Growth Rate Toxic Dinoflagellates													R/M-49
Marine Fishery Policy - New York State			R/F-1	R/M-3	-----C								
Economics of Marine Industry						R/F-8	-----	C					
Multiple Species Fishery Model								R/F-11	-----C				
Mgmt Strategies Mid-Atlantic Fisheries								R/F-13	-----C				
Is Extended Jurisdiction Working?								R/F-14	-----C				
Council Study of New England Region								R/F-15	-----C				
Economic Eval Striped Bass Fishery									R/F-29	-----	C		
Criteria for Transfer of Shellfish										R/F-23			
Mgmt of Multiple Cohort Fishery										R/F-24			
Costs/Returns Otter Trawl Fleet										R/F-25	-----C		
Improving Fuel Efficiency of Vessels											R/E-15	-----C	
FPC Potential - Lake Erie		R/F-3											
Larval Fish Survey - Lake Ontario			R/M-4										

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	2	6	6	2	2	2	7	6	8	9	7	4	2
Percentage of pledged match	-	3	4	2	1	2	1	6	11	5	1	1	1
Percentage of total projects in year	4	6	6	3	3	5	8	12	18	10	7	7	6
Number of participating faculty	1	2	2	1	1	2	4	7	12	6	5	6	3
Disciplines of participating faculty	BIOL	F BIOL	BIOL F	F	F	F	F BIOL ECON	F ECON REC	F ECON REC MICRO SOC VET	F VET MICRO ECON	F MA ECON	BIOL MA F	F BIOL
Research Publications - Articles	2	-	-	1	3	-	1	-	3	2	2	-	-
Reports	-	-	1	1	1	1	-	1	-	-	-	1	-
Popular	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	1	-	-	-
Extension Effort-FTE - Marine	0.6	0.9	1.0	1.2	1.5	1.6	1.5	2.1	2.3	2.1	2.4	2.2	2.8
Great Lakes	-	-	0.1	0.1	0.1	-	-	-	-	-	-	-	-
Extension Outreach - Publications	-	-	1	-	-	2	-	-	-	-	1	1	-
Information Pieces	-	2	1	1	1	-	-	-	-	-	1	1	-
Audio-Visual	-	-	-	-	-	-	-	-	-	-	-	-	-
Newsletter	-	-	-	-	-	-	-	X					
Number of Participating Students	-	-	2	3	4	2	3	6	10	8	7	4	4
Theses Produced	-	-	2	-	1	1	-	1	1	1	2	1	2



## **Research: Fisheries**

### **Program Element: The Fisheries**

**What:** Research on commercial fisheries, particularly the shellfishery, of New York's marine waters. **Why:** New York is a major consumer of seafoods creating a market for locally caught fish. Long Island's water have for several centuries been productive of highest quality shellfish. Those same waters have traditionally been free from diseases which have so adversely affected other east coast shellfish producing states. **Outcome:** Although New York still has few fishery scientists, research capability, particularly with respect to shellfish, has been growing. Strong Extension programs have made significant contributions to the commercial fishing industry.

This research area is limited to the marine district as development of commercial fishing in New York's Great Lakes waters is discouraged (a small fishery in Lake Erie for non-sport species is discussed, but as the commercial fishing fleet number less than 6 vessels, the potential is small).

Landed value of fish and shellfish in New York, as reported, ranks behind dairy products, beef, eggs, and poultry among the state's agricultural products. The most valuable crop has been the hard clam which at its peak in 1977 represented three-quarters of the landed value of all fish and shellfish. Since then production of the hard clam from Great South Bay, the principle source, has fallen by 75%. Oysters, once the dominant crop, are now almost entirely produced through aquaculture. Surf clams, lobsters, soft shelled clams, bay scallops and mussels represent the balance of the shellfish harvest. The finfishery has been based on low-volume, high-value species such as bluefish, flounder, striped bass, scup and weakfish. There has been an increase in production of non-traditional species such as whiting, tilefish and butterfish.

Historically, the finfisheries services the fresh fish trade. As many of previously underutilized species are not suited for marketing in the round or as fillets, there is increasing interest in developing processing facilities in New York to handle the increased harvest of these species. Fishport may be such a development.

A significant new development in the finfishery is the collaboration of New York fishermen with foreign catcher/processor vessels in joint ventures-- efforts to date targeted primarily at squid. The volume of squid harvested by New York vessels in these operations now exceeds by a substantial margin that harvested and landed at New York ports. Sea Grant Extension Specialists were instrumental in coordinating arrangements between the New York fishermen and the foreign partners.

Sea Grant research in the fisheries has been constrained by an absence of faculty in fishery biology or related fields. Sea Grant's first professorship, in shellfish biology, was awarded to SUNY at Stony Brook. With that appointment New York State gained its first faculty member with a competence in shellfish biology in the broadest definition. Extension programming in the finfishery has had to rely heavily upon research resources from other states, a matter which has been a major source of friction between the commercial fishing interests and Sea Grant.

As a result of limited academic resources, most Sea Grant fishery research, except for that on shellfish, has been in related disciplines: economics,

policy studies, and the outpouring of J.L. McHugh's library-based studies describing the history, status and major issues confronting both the shell and finfisheries. Since the appointment of Robert Malouf, there has been extensive study of the biology of the hard clam, and of the hard clam fishery (see also Program Element: Great South Bay Study). Research emphasis has shifted from Mercenaria mercenaria to other shellfish, most importantly the bay scallop. That fishery needs assistance, and the species is a prime candidate for aquaculture: Research can meet both needs.

The shellfishery is plagued not only by the common problems of management, but also by pollution and other factors. In the early 1980's Gonyaulax, the red tide organism was discovered in Long Island's waters, apparently for the first time. It is not known if this results from southward migration of the species, or if shellfish transplant operations brought it in. At this time there has not been a documented human-health problem but Sea Grant, in collaboration with Suffolk County Health Department, Nassau County Health Department and the NYS Department of Environmental Conservation, are conducting surveys and research to assess the significance of the threat to the hard clam fishery and the development of appropriate management practices.

A sharp increase in the number of Norwalk Virus induced gastrointestinal disorders directly related to shellfish consumption has been noted since 1982. Implicated shellfish have been from England, New England and New York. An Inter-agency Task Force on Shellfish Disease composed of the Sea Grant Institute, the NYS Departments of Health, Agriculture and Markets and Environmental Conservation, was constituted. Sea Grant and the Health Department collaborated in producing informational materials on the health advisory on shellfish consumption ordered by the Department of Health. Previous Sea Grant research on depuration (see Program Element: Aquaculture and Natural Products) has suggested to state officials that this technology is not feasible as a means of reducing this disease problem.

It is generally believed that Norwalk Virus contaminated clams result from the sale of clams illegally taken from closed waters (over 25,000 acres of shellfish grounds in New York are closed because of pollution by sewage). Sea Grant Extension Specialists Scotti and Smith helped organized an industry-led effort in self-enforcement against poaching from closed waters. This important activity--the "Green-Seal Program"--has been rewarding in that no Green Seal clams have been involved in a shellfish disease incident.

There are increasing signs that fish, particularly striped bass, spawning in the Hudson River, may be accumulating PCBs in levels above those allowed for interstate shipment. A health advisory on Hudson spawned species may be announced in the next year.

## Research: Fisheries

Table R29. Project Titles

R/A-11	Population Dynamics of the Hard Clam in Great South Bay, New York	Youngs
R/D-5	Ecology of the Peconics: Planktonic Fish Eggs and Larvae	Williams
R/E-15	Improving Fuel Efficiency of Commercial Fishing Vessels	Hamlin/ Hadler/ Rowen/ Sedat
R/F-1	Policy Formulation and Economic and Social Values of the Fisheries of New York State	McHugh
R/F-3	Potential of a Fish Protein Concentrate Industry Based on the Lake Erie Fishery	Sweeney
R/F-7	Population Dynamics of the Great South Bay Shellfishery	Malouf
R/F-8	Management Economic of New York's Marine Industries	Conrad
R/F-10	Basic Population and Biological Data for Spiny Dogfish, <u>Squalus acanthias</u>	Woodhead
R/F-11	A Multiple Species Fishery Model: An Output-Input Approach (Pilot Study)	Hoppensteadt/ Sohn
R/F-13	Application of Management Strategies to the Mid-Atlantic Extended Jurisdiction Recreational Fisheries	Wilkins/ Everhart
R/F-14	Is Extended Jurisdiction Working?	McHugh
R/F-15	The New England Regional Fisheries Management Council - Year II	Smith
R/F-23	Development of a Program of Health Certification Criteria for Transfer of Molluscan Stocks into and out of New York State	Elston/ Leibovitz
R/F-24	Management of a Multiple Cohort Fishery: The Hard Clam in Great South Bay	Conrad
R/F-25	Costs and Returns in the Otter Trawl Fleet on Long Island, New York	Conrad
R/F-28	Differentiation of Populations of Yellow Tailed Flounder off New York and New England	Woodhead
R/F-29	An Economic Evaluation of the Atlantic Coast Striped Bass Fishery	Conrad

R/M-4	Larval Fish of the Near Shore Zone of Lake Ontario	Engel
R/M-24	History of Hard Clam Industry and Resource	McHugh
R/M-41	Implication of Dramatic Increases in Sand Lance ( <u>Ammocetes</u> spp.) in New York Coastal Waters	Peterson
R/M-47	Dynamics of Recruitment, Growth and Survival of Juvenile Bay Scallops ( <u>Argopecten irradians</u> ) within Beds of Eelgrass ( <u>Zostera Marina</u> )	Malouf/ Eckman
R/M-48	Relation of Environmental Variables to Fluctuations in Abundance and Distribution of Fish Stocks off the U.S. Northeastern Seaboard	Woodhead/ Conover
R/M-49	Growth Rate of the Toxic Dinoflagellate <u>Gonyaulax tamarensis</u> in a Long Island Estuary	Carpenter



**Research: Fisheries**

**Table R30. Journal Articles**

Cohen, G.; Schrier, E.

Removal of Mercury From Fish Protein Concentrate by Sodium Borohydride Reduction.

Agriculture and Food Chemistry, Vol.23, No.4, July/August 1975.  
7500

Conrad, J.

Management of a Multiple Cohort Fishery: The Hard Clam in Great South Bay.

American Journal of Agricultural Economics, Vol.64, No.3, August 1982.  
8200

Dawson, C.; Wilkins, B.

Social Considerations Associated with Marine Recreational Fishing Under FCMA.

Marine Fisheries Review, December 1980.  
8000

Dawson, C.; Wilkins, B.

Motivations of New York and Virginia Marine Boat Anglers and their Preferences for Potential Fishing Constraints.

North American Journal of Fisheries Management Vol. 1, 1981.  
8100

McHugh, J.

Jeffersonian Democracy and the Fisheries.

World Fisheries Policy-Multidisciplinary Views. Vol.IV in Public Policy Issues in Resource Management. Crutchfield and Pealy, eds.U of Wash Press,1972.  
7200

McHugh, J.

Does Fishing Have a Future?

Search Magazine, No.2, Winter 1975/1976.  
7600

McHugh J.

History and Management of Weakfish Fisheries.

Proceedings of the Colloquium on the Biology and Management of Red Drum and Seatrout, 19 October 1978.  
7800

McHugh, J.

Effects of Climatic Change on Fisheries.

National Climate Program Act. Hearings Before the Subcommittee on the and Technology, US House of Rep., 94th Congress, 2nd Session, 18 May 1976.  
7600

McHugh, J.

Estuarine Fisheries: Are They Doomed?

Journal of Estuarine Processes, Vol.1, 1976.  
7600

McHugh, J.  
Marine Fisheries of New York State.  
Fishery Bulletin, Vol.70, No.3, 1972.  
7200

McHugh, J.  
Limited Entry as a Conservation Measure.  
Limited Entry as a Fishery Management Tool. R. Retting  
and J. Ginter, eds., 1980.  
8000

McHugh, J.  
Marine Fisheries of Delaware.  
Fishery Bulletin, Vol.79, No.4, 1981.  
8100

Smith, E.  
Fisheries Management: Intended Results and Unintended Consequences.  
Modernization and Marine Fisheries Policy. J. Maiolo and M. Orbach,  
eds., 1982.  
8200

Woodhead, P.; Woodhead, A.  
Further Observations on Twinning in the Spiny Dogfish.  
The Bulletin of the Mount Desert Island Biological Laboratory,  
Salisbury Cove, Maine, Vol.20, 1980.  
8000

**Research: Fisheries**

**Table R31. Sea Grant Scholars/Theses**

**Current**

**Susan Troll**

**DETERMINATION OF IN SITU GROWTH RATE OF THE TOXIC DINOFLAGELLATE (GONYULAX TAMARENSIS) IN A L.I. ESTUARY**

**Graduated. Thesis Submitted**

**Seth Ausubel**

**THE LIFE HISTORY AND FEEDING ECOLOGY OF THE LARVAE OF ATLANTIC MACKEREL IN LONG ISLAND SOUND**

**8312**

**Elizabeth Bass**

**GROWTH OF HARD CLAMS (MERCENARIA MERCENARIA) FEEDING ON CHLOROPHYTE AND CYANOBACTERIAL PICOPLANKTON**

**8212**

**\*Monica Bricelj**

**FECUNDITY AND RELATED ASPECTS OF HARD CLAM REPRODUCTION IN THE GREAT SOUTH BAY, NEW YORK**

**8401**

**Gerald Cohen**

**REMOVAL OF MERCURY FROM FISH PROTEIN CONCENTRATE**

**7405**

**Paul Flagg**

**EFFECTS OF ENVIRONMENTAL FACTORS AND METHODS OF PROTECTION ON THE GROWTH AND SURVIVAL OF HATCHERY PRODUCED SEED CLAMS**

**7905**

**\*Mary Gibbons**

**FACTORS INFLUENCING PREDATION ON JUVENILE MERCENARIA BY THE CRABS NEOPANOPEUS SAYI, OVALIPES OCELLATUS AND PAGURUS LONGICA**

**8105**

**William Knapp**

**MARINE COMMERCIAL FISHERIES OF NYS:AN ANALYSIS BY GEAR**

**7405**

**Margaret Lounsbury**

**IS EXTENDED JURISDICTION WORKING: AN ANALYSIS OF THE SURF CLAM AND OCEAN QUAHOG MANAGEMENT PLANS**

**8005**

**Doreen Monteleone**

**YEAR TO YEAR VARIATIONS IN ABUNDANCE AND FEEDING ECOLOGY OF SAND LANCE LARVAE IN LONG ISLAND SOUND**

**8405**

**Michael Sigler**

**AN EXPERIMENTAL STUDY OF THE INTOXICATION OF HATCHERY-REARED OYSTER LARVAE WITH OIL AND BILGE CLEANERS**

**8205**

**Christopher Smith**

**ASPECTS OF HARD CLAM MANAGEMENT IN THE GREAT SOUTH BAY, NEW YORK**

**7705**

William Wise  
THE FISHERIES AND FISHERY RESOURCES OF LONG ISLAND SOUND  
7605

Status Uncertain

\*Fred Farah 7705  
Heidi Kaplan 8205  
Steven McCafferty 8205  
Kim McKown 8406  
Robert Silbajoris 7605  
\*Dale Squires 8205  
\*Catherine Thompson 8205

Did Not Graduate

Raoul Castaneda 8005  
\*Gregory Greene 7812  
\*Wayne Penello 8012  
\*James Sieber 8205  
John Zimmerman 7905

\*Doctoral Candidate

Research: Fisheries

Table R32. Sea Grant Scholars/First Occupation

Seth Ausubel 8312	Kim McKown 8406
Elizabeth Bass 8212 L.L. Bean	Doreen Monteleone 8405 Environmental Consulting Firm, Long Island
Monica Bricelj 8401 Asst. Professor, Long Island Univ.	Wayne Penello 8012 Commodity Trader, NY Stock Exchange
Raoul Castaneda 8005 Technical Specialist, MSRC	James Sieber 8205
Gerald Cohen 7405	Michael Sigler 8205
Fred Farah 7705 Environmental Consultant, NYC	Robert Silbajoris 7605 Chemist, Cleveland Municipal Sewer District
Paul Flagg 7905 Environmental Consultant	Christopher Smith 7705 Extension Specialist, NY Sea Grant
Mary Gibbons 8105 Staff Oceanographer, VIMS	Dale Squires 8205 NMFS, Gloucester, MA.
Gregory Greene 7812 Lockwood, Kessler & Bartlett, Inc.	Catherine Thompson 8205 PhD candidate, Business Administration, Univ. of Maine
Heidi Kaplan 8205 PhD candidate, Microbiology, Cornell	Susan Troll 8412
William Knapp 7405 USFWS, Massachusetts	William Wise 7605 Asst. Director for Programs, NY Sea Grant Institute
Margaret Lounsbury 8005 Technical Specialist, MSRC	John Zimmerman 7905 Non-Marine Consulting Firm, CT.
Steven McCafferty 8205	



Research: Great South Bay Study

Table R33. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Development of Great South Bay Plan							R/P-22						
Analysis Shellfish Sanitation Data							R/A-13						
Circulation and Groundwater Flow								R/B-1		C			
Sediment Effects on Nitrogen Cycle								R/B-2		C			
Eval of Seed Clam Planting Program									R/F-17	C			
Antropogenic Contamination of Sediments									R/B-3	C			
Eelgrass Dist. by Remote-Sensing									R/B-4	C			
Coliform Analysis of GSB										R/A-13			
Hard Clam Abundance and Distribution										R/B-5			
Ident. Hard Clam Broodstock Areas										R/B-7	C		
Salt Marsh - GSB Nutrient Exchange										R/B-8	C		
Nutrient-Floral Relationships											R/B-10		
Synthesis of GSB Study Results												R/B-11	

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	-	-	-	-	-	-	0	-	7	15	2	1	-
Percentage of pledged match	-	-	-	-	-	-	3	-	0	9	1	3	-
Percentage of total projects in year	-	-	-	-	-	-	4	-	6	18	2	2	-
Number of participating faculty	-	-	-	-	-	-	2	-	8	16	1	1	-
Disciplines of participating faculty	-	-	-	-	-	-	PO PHYS	-	BIOL F PO GO	BIOL GEOL F PHYS PA PO	BIOL	PO	-
Research Publications - Articles	-	-	-	-	-	-	-	-	3	-	4	4	-
Reports	-	-	-	-	-	-	-	-	-	-	-	-	-
Popular	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	2	-	-	-
Extension Effort-FTE - Marine	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	-	-	-	-	-	-	-	-	-	-	-	-	-
Extension Outreach - Publications	-	-	-	-	-	-	-	-	-	-	-	-	-
Information Pieces	-	-	-	-	-	-	-	-	-	-	-	-	-
Audio-Visual	-	-	-	-	-	-	-	-	-	-	-	-	-
Newsletter	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Participating Students	-	-	-	-	-	-	-	4	9	12	10	4	1
Theses Produced	-	-	-	-	-	-	-	-	1	1	3	1	-

## Research: Great South Bay Study

### Program Element: The Great South Bay Study

**What:** A comprehensive study of the Great South Bay, Long Island. **Why:** Great South Bay has been a major producer of hard clams for the nation and was the most significant part of New York's commercial fishery. Insufficient knowledge of the natural processes of the Bay hindered sound management plans needed to sustain this high level of production. **Outcome:** A comprehensive study was planned and carried out with Sea Grant and state funds. Research results are being transformed into management plans through a series of locally funded workshops and study projects. A synthesis volume is being produced summarizing, for a non-technical audience, the findings of the Great South Bay Study. Specific outcomes include:

- o The Great South Bay Study has served as a model for other environmental systems studies carried out by Sea Grant and other groups.
- o A liaison between New York Sea Grant's Great South Bay researchers and Rhode Island Sea Grant's coastal ponds study was developed.
- o As a result of the above liaison a symposium on coastal lagoons was held during the 1983 International Estuarine Research Conference.

The Great South Bay Study developed from a question asked of Sea Grant by a Deputy Commissioner, NYS Department of Environmental Conservation (DEC): "What is the most important coastal problem facing Long Island?" From the answer that Great South Bay was, grew a plan for a jointly developed, conducted and funded research program. In the end, the DEC was not able to provide funds for the program, but it did participate in the planning phase.

Planning meetings for the study were held with scientists from many academic institutions, consulting firms, local governments and fishery organizations. Although it was originally envisioned that many of those who assisted in the development of the study plan would also participate in the research, this did not happen. Throughout the conduct of the study, briefing meetings were held with local governments and industry, although the latter group was always under-represented. These meetings had informational value, but the slow pace of the research made it difficult for the non-participant to be closely involved. A major contribution towards the project was the appointment of the first Sea Grant Professor (in shellfish biology), Robert Malouf, just prior to the development of the study plan. Professor Malouf soon had most of the Long Island town shellfish managers as graduate students. Their research and interaction with the Great South Bay participants, both faculty and students, was a major information transfer factor. The research has led to some extension programming in hard clam management, but the workshops now being conducted will probably generate greater potential for extension activities.

Since the conclusion of the Sea Grant sponsored portion of the Great South Bay Study, the Marine Sciences Research Center has been successful in obtaining local government support for studies and workshops intended to carry the findings of the study into management plans for the hard clam stocks of Suffolk County. Sea Grant participates in these activities. Examples of how the study has influenced management of the Great South Bay's hard clam fishery include:

- o Hard clam spawner sanctuaries recommended by the study have become part of the clam management programs of two towns;
- o Town shellfish managers have used the numeric model of the Bay's circulation, developed under the Study, to site spawner sanctuaries;

- o The quantity, distribution, and individual size of seed clams planted by the towns bordering the Bay have been changed to maximize survival, following information developed by the study;

- o The practice of relaying spawner clams from other locations into Great South Bay to maximize larval sets has been greatly reduced after Study results indicated it was most probably ineffective;

- o Determination by the DEC of location of conditionally-opened clamming areas is being aided by analysis of impacts of rainfall events on coliform counts in Bay waters conducted as a part of the study.

The Plan for the Great South Bay Study was organized around the focus of the hard clam fishery and its productivity problems. From that focus was developed a series of questions which required study, or even basic data collection. A series of tasks were then framed which, if properly conducted and inter-related, would result in the required information being developed. The tasks were also couched in such a way that level of effort required, and probable costs, were projected. The Task statements could then be utilized as the basis of a call-for-proposals.

Because of the planned-for participation of the State in this research program, it had been hoped that a cross-section of academic institutions and consulting firms would participate in the study. With State funds disappearing and Sea Grant taking up the slack, only academic institutions remained. It became clear that those individuals and institutions carrying out the first year's work had a monopoly on the project through control of data and information. Stony Brook's Marine Sciences Research Center, having been a principal in the development of the research program, was in a key position and was successful in initiating research. The inability of other institutions to effectively compete caused some feeling of favoritism. It seems clear that if participation by various institutions is desired in such a study, it would have to be vertically structured with all institutions involved from the beginning.

## Research: Great South Bay Study

Table R34. Project Titles

R/A-13	Analysis of Shellfish Sanitation Data	Weyl
R/A-13	Coliform Analysis of Great South Bay	Weyl
R/B-1	A Study of the Circulation and Ground-Water Flows in Great South Bay, New York	Carter/ Wilson/ Bokuniewicz
R/B-2	Sediment Effects on the Nitrogen Cycle in Great South Bay, New York	Carpenter/ Brinkhuis/ Esaias
R/B-3	Extent and Origin of Anthropogenic Contamination of Fine-Grained Great South Bay Sediments	Hirschberg
R/B-4	Analysis of Eelgrass Distribution and Growth Characteristics in Great South Bay by Multi-Spectral Scanning	Brinkhuis/ Churchill
R/B-5	Synthesis and Analysis of Great South Bay Hard Clam Abundance and Distribution Data	Steinberg
R/B-7	Identification of Hard Clam Broodstock Areas Which Produce Sets on Productive Beds	Carter/ Malouf/ Wilson
R/B-8	Great South Bay Salt Marsh Nutrient Exchange	Carpenter/ Capone
R/B-10	Modeling of Nutrient-Floral Relationships in Great South Bay	Carpenter
R/B-11	Synthesis of the Results of the Great South Bay Study	Carter
R/F-17	An Evaluation of Seed Clam Planting in Long Island: A Cooperative Approach	Malouf/ Flagg
R/P-22	Development of a Management Plan for the Waters of Great South Bay	Schubel



## The Great South Bay Study Plan

### I. Clam distributions and their biological determinants in Great South Bay

Task 1. Survey hard clam distribution and abundance.

Task 2. Determine the environmental factors characteristic of "good" and "poor" clam areas.

Task 3. Study the reproduction of hard clams.

Task 4. Evaluate programs to artificially enhance recruitment.

### II. Nutrients and their fluxes in Great South Bay

#### A. Phytoplankton/Nutrient relationships

Task 5. Collect approximately a year of nutrient and phytoplankton species distribution data at a number of stations representative of various portions of the Great South Bay.

Task 6. Analyze nutrient and phytoplankton data.

Task 7. Determine nutrient input from tidal marsh and other boundary areas.

#### B. Distribution, Abundance and Productivity Patterns of Eelgrass

Task 8. Determine the density of eelgrass throughout Great South Bay.

#### C. Nutrient Distribution Patterns and Dynamics in Eelgrass Beds

Task 9. Determine nitrogen, phosphorus and carbon exchanges between the water column, eelgrass tissues (when the grass is present) and the sediment milieu.

### III. Circulation and diffusion in the water in the Bay and the exchanges of water between Bay and ocean

Task 10. Determine the relation between the non-tidal current and the local wind.

Task 11. Analysis of wind, current, and elevation data together with a study of Fire Island Inlet to measure the fraction of water that leaves Great South Bay on the ebb tide and the fraction of the discharged fraction that subsequently returns on the next flood.

Task 12. Make site specific studies to determine the probable location of the brood stock which produced the sets on those beds that have been designated as productive.

Task 13. Observe the groundwater flow into the Bay to define the magnitude of the inflow and its variability.

Task 14. Funding permitting, characterize the salinity distribution of Great South Bay on at least a seasonal basis.

### IV. Bottom sediment distributions and characteristics in Great South Bay

Task 15. Design and implement a sampling and analysis program to provide coverage of the unstudied surficial sediments of Great South Bay.

Task 16. Assess the role of man in determining the flux of selected materials to the recent sedimentary record (over approximately the past 150 years) in selected areas of Great South Bay.

### V. Pollution which renders Clams unavailable or unfit for human consumption: A Coliform Model for Great South Bay

Task 17. Assemble and analyze coliform data for Great South Bay for the last five years.

Task 18. Explain current coliform distributions under various conditions.

Task 19. Assess the relative impact of steady discharges and storm events on coliform contamination levels.

### VI. A Long-Term Monitoring Program

Task 20. Maintain one permanent tide gauge in the central part of the Bay.

Task 21. Average salinity and nutrient concentration (nitrogen and phosphorus) in the Bay should be monitored on a weekly basis.



Table R35. Journal Articles

Bokuniewicz, H.

Groundwater Seepage into Great South Bay, New York.

Estuarine and Coastal Marine Science, Vol.10, 1980.

8000

Capone, D.; Carpenter, E.

Perfusion Method for Assaying Microbial Activities in Sediments:

Applicability to Studies of  $N_2$  Fixation by  $C_2H_2$  Reduction.

Applied and Environmental Microbiology, Vol.43, No.6, 1982.

8200

Capone, D.; Carpenter, E.

Nitrogen Fixation in the Marine Environment.

Science, Vol.217, 17 September 1982.

8200

Capone, D.; Budin, J.

Nitrogen Fixation Associated with Rinsed Roots and Rhizomes of the Eelgrass  
ZOSTERA MARINA.

Plant Physical, Vol. 70, 1982.

8200

Capone, D.

Benthic Nitrogen Fixation.

Nitrogen in the Marine Environment. E. Carpenter and D. Capone, eds., 1983.

8300

Capone, D.

$N_2$  Fixation in Seagrass Communities.

Marine Technology Society Journal, Vol. 17, No. 2, 1983.

8300

Carpenter, E.; Lively, J.

Review of Estimates of Algae Growth Using  $^{14}C$  Tracer Techniques.

Primary Productivity in the Sea. P. Falkowitz, Plenum Publishing, 1980.

8000

Kaufman, Z.; Lively, J.; Carpenter, E.

Uptake of Nitrogenous Nutrients by Phytoplankton in a Barrier Island Estuary:  
Great South Bay, New York.

Estuarine, Coastal and Shelf Science, Vol. 17, 1983.

8300

Lively, J.; Kaufman, Z.; Carpenter, E.

Phytoplankton Ecology of a Barrier Island Estuary: Great South Bay, NY

Estuarine, Coastal and Shelf Science, Vol.16, 1983.

8300

Sarokin, D.; Carpenter, E.

Ultrastructure and Taxonomic Observations on Marine Isolates of the Genus  
Nannochloris (Chlorophyceae).

Botanica Marina, Vol.25, 1982.

**Research: Great South Bay Study**

8200

Steinberg, M.

A Preliminary System Dynamics Model of the Effectiveness of Shellfish Hatcheries on Increasing Harvestable Yield.

Proceedings of the International Conference on Cybernetics Society, Institute of Electrical and Electronics Eng., 1980.

8000

**Table R36. Sea Grant Scholars/Theses**

**Current**

\*Yong Park

NITROGEN EXCRETION BY ZOOPLANKTON IN GREAT SOUTH BAY

**Graduated, Thesis Submitted**

Elizabeth Adamson

SEASONAL VARIATIONS OF CARBON UPTAKE AND TRANSLOCATION BY EELGRASS

8201

Howard Barton

UPTAKE AND TRANSLOCATION OF NITROGENOUS NUTRIENTS BY EELGRASS ZOSTERA MARINA

8001

John Nicholson

SEASONAL CHANGES OF THE NITROGENOUS POOLS AND THE POTENTIAL MOVEMENT OF NITROGEN THROUGH THE INLETS OF THE GREAT SOUTH BAY SYSTEM

8301

Cornelia Schlenk

CHARACTERISTICS OF LAMINARIA SACCHARINA CULTIVATED IN LONG ISLAND SOUND

8108

Jeffrey Snow

COLIFORM ANALYSIS OF GREAT SOUTH BAY

8205

Philip Zion

ASSESSMENT OF REMOTE SENSING METHODS IN A SHALLOW TIDAL BAY

8212

**Status Uncertain**

Perry Bodnar 8212

Cynthia Dietz 8105

Ronald Filadelfo 8105

Michael Fischer 8105

Zena Gold-Kaufman 8005

Amy Knutson 8212

John Lively 8005

Paul Novelli 8205

Suzanne Schrey 8309

\*Doctoral Candidate

Table R37. Sea Grant Scholars/First Occupation

Elizabeth Adamson 8201 NYC Dept. of Environmental Protection	Suzanne Schrey 8309 MSRC Research Assistant
Howard Barton 8001 Technical Specialist, MSRC	Cornelia Schlenk 8108 Technician, Biomass Project
Joseph Bergstein 8301 Private Sector, Non-Marine work, NYC	Jeffrey Snow 8205 Associate Engineer, United Technologies, CT.
Perry Bodnar 8212 MS Candidate, Adelphi Univ.	
Cynthia Dietz 8105 Master's candidate, MSRC	
Ronald Filadelfo 8105 Master's candidate, MSRC	
Michael Fischer 8105 Master's candidate, Adelphi Univ.	
Zena Gold-Kaufman 8005 Technical Specialist, MSRC	
Amy Knutson 8212 Technical Specialist, Ecology and Evolution, SUNY at Stony Brook	
John Lively 8005 Research Associate, WHOI	
John Nicholson 8301 MBA candidate	
Paul Novelli 8205 Working with Dr. Mary Scranton, MSRC	
Yong Park 8412	

Table R38. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Effects of Heated Effl on Lake Temp	R/Q-2												
Phys Ecol of Stressed Arthropods	R/Q-3												
Effects of Heated Effl on Atmosphere	R/Q-4												
Mixing by Langmuir Circulations	R/Q-7												
Dissipation of Heated Waters	R/Q-11												
Isotherms under Ice Cover	R/Q-12												
Thermal Discharge - How To Use It	R/D-2												
Siting Policy - Present and Future		R/P-1	-----C										
Multiple Use of Effluents and Sites		R/P-2	-----C										
Evaluation of Thermal Criteria		R/P-3	-----C										
Analysis of Plumes and Criteria			R/P-7										
Alternate Means of Cooling			R/P-4										
Modelling & Analysis of Use of Heat			R/P-5	-----C									
Multiple Use - Sites and Buffer Zones			R/P-6										
Modelling Biological Impacts			R/P-8										



	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	15	12	12	1	-	-	-	-	-	-	-	-	-
Percentage of pledged match	-	25	10	1	-	-	-	-	-	-	-	-	-
Percentage of total projects in year	27	10	23	3	-	-	-	-	-	-	-	-	-
Number of participating faculty	7	8	13	1	-	-	-	-	-	-	-	-	-
Disciplines of participating faculty	ATMOS BIOL PHYS ENVENG	ATMOS BIOL PA POL SOC	ATMOS BIOL MENG POL SOC	MENG	-	-	-	-	-	-	-	-	-
Research Publications - Articles	1	3	-	-	1	-	-	-	-	-	-	-	-
Reports	-	1	-	1	-	-	-	-	-	-	-	-	-
Popular	-	-	1	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-
Extension Effort-FTE - Marine	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	-	-	0.3	0.5	0.1	-	-	-	-	-	-	-	-
Extension Outreach - Publications	-	-	-	-	-	-	-	-	-	-	-	-	-
Information Pieces	-	-	-	-	-	-	-	-	-	-	-	-	-
Audio-Visual	-	-	-	-	-	-	-	-	-	-	-	-	-
Newsletter	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Participating Students	-	-	-	-	1	1	-	-	-	-	-	-	-
Theses Produced	-	-	-	-	-	-	-	-	-	-	-	-	-

## Research: Power Plant Siting

### Program Element: Power Plant Siting on Lake Ontario's Coast

**What:** A multidisciplinary program to investigate aspects of power plant siting regulations, procedures, and environmental impacts. **Why:** Power plant siting related problems had been identified by Sea Grant's Great Lakes Advisory Council as a priority research area because the State had plans for "Power Parks" along Lake Ontario's coast. **Outcome:** In addition to the specific accomplishments noted, much gained by the Sea Grant program management from the experience of managing a multi-campus, inter-disciplinary program. Specific accomplishments include:

- o The Lake Ontario Atlas series (see Describing the Coastal Region) was conceived as a means of displaying basic environmental information required for location of the "Power Parks."

- o The State Legislature utilized research results in defining a new procedure for the siting of electrical generating plants.

- o The Public Service Department utilized information on thermal plumes in restating its discharge criteria.

The Public Service Department of New York had, in the late 1960's, adopted a policy of developing "Power Parks" along the shore of Lake Ontario. These "Power Parks" were seen as concentrations of 1000 Megawatt nuclear steam electric generating stations. The social, economic, and environmental impacts of the "Power Parks" was unknown. Siting policy, at this time of major development of electric power generating facilities, was felt to be inadequate and in need of refinement.

This research element was the first multi-campus, interdisciplinary research program of New York Sea Grant. Building on interests exhibited by researchers in submissions to the first institutional proposal, the Sea Grant program had by its second year assembled three multi-disciplinary teams who could address the policy questions, environmental impacts and alternative means of utilizing waste heat from the plants. As a corollary to the development of the research thrust, an extension program in power-plant siting was developed.

In hind-sight electric power generation/environmental impact issues can be seen as one of the several environmental over-reactions of the period. But at that time both public and official concerns were great. The State Legislature did utilize findings of the research in redefining siting policy and the State's Public Service Commissioners utilized thermal plume analyses in making recommendations on thermal discharge criteria and plant design. But the projected extensive development of electric power generating plants did not materialize, so the cumulative effect of the research was substantially less than might have been. For example, none of the sites studied for multiple utilization has been developed for power generation.

Again, in hind-sight, a factor in the failure of the multi-campus, multi-disciplinary research to realize its full potential was the insufficiency of Sea Grant management staff and its inexperience in managing such activities. That lesson was well learned, and contributed to the redesign of the Sea Grant Institute. Among the lessons learned were:

1. To gain a higher rate of productivity from researchers required a greater investment of management time: Institute capability to monitor research had to be increased.

2. Inter-campus interactions may not be assumed to occur without outside stimulus. Continuing follow-up must be in place to insure that researchers

will interact, and that at least some of those interactions will occur with "users" of the research.

3. Inter-disciplinary research will not naturally produce the synergistic benefits expected, but must be fostered and encouraged.

4. Without interaction of staff and researcher a full appreciation of the benefits and accomplishments of the research is not obtained.

The functions identified by those findings are now seen as a major contribution of Institute staff to the research program.

## Research: Power Plant Siting

Table R39. Project Titles

R/D-2	Thermal Discharge--How to Use It	Stewart
R/P-1	Siting Policy - Present and Future	Crow
R/P-2	Multiple Utilization of Thermal Discharge, Buffer Zones and/or Corridors	Stewart
R/P-3	Evaluation of Existing Thermal Criteria	McNaught
R/P-4	Alternate Means of Cooling for Electricity Generating Stations--Analysis of Feasibility	Stewart/ Czapski
R/P-5	Modelling and Analysis of System to Utilize Heated Effluents	Price
R/P-6	Multiple Utilization of Power Plant Buffer Zones and/or Corridors	Scott/ Wilson/ Stewart
R/P-7	Analysis of Thermal Plumes and Criteria Governing Them	Chermack
R/P-8	Modelling of Biological Impacts of Thermal Discharge upon Lake Ontario	Glase/ McNaught
R/Q-2	The Impact of Power Plant Heated Effluents on the Lake Temperature Environment	Chermack
R/Q-3	The Physiological Ecology of Aquatic Arthropods in a Stressed Environment	Costa
R/Q-4	The Atmospheric Effect of Thermal Effluents into Lake Ontario	Czapski
R/Q-7	Mixing of Water Surface Layers by Steady Langmuir Circulations	Leibovich
R/Q-11	Dissipation of Thermal Effluents by Currents in Lake Ontario and the Effect of Thermal Emmisions on Circulation Patterns	Scott
R/Q-12	Isotherms Under the Ice of Lake Erie	Stewart

Table R40. Journal Articles

Chermack, E.; Galletta, T.  
Power Plant Thermal Effluents in Southeastern Lake Ontario.  
Proceedings of the Sixteenth Conference on Great Lake Research, 1973.  
7300

Craik, A.; Leibovich, S.  
A Rational Model for Langmuir Circulations.  
Journal of Fluid Mechanics, Vol. 73, Part 3, 1976.  
7600

Leibovich, S.; Ulrich, D.  
A Note on the Growth of Small-Scale Langmuir Circulations.  
Journal of Geophysical Research, Vol. 77, No. 9, 1972.  
7200

Stewart, K.  
Winter Conditions in Lake Erie with Reference to Ice Thermal Structure and  
Comparison to Lakes Winnebago (Wis.) 7Mille Lacs (Min.)  
Proceedings of the Sixteenth Conference on Great Lake Resources, 1973.  
7300

Stewart, R.; Czapski, U.; Nelson, R.  
Meteorological Effects of Spray-Cooling in the Great Lakes Climate.  
Proceedings of the Sixteenth Conference of Great Lake  
Resources, 1973.  
7300

Table R41. Sea Grant Scholars/Theses

Current

NONE

Graduated, Thesis Submitted

NONE

Did Not Graduate

Philip Cross 7705

Table R42. Sea Grant Scholars/First Occupation

Philip Cross  
7705  
NYS Health Dept.



Table R43. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Problems in Coastal Law					R/L-3								
Studies in Coastal Law												R/L-6	
NYC Waterfront Building Standards									R/L-4				
Perspectives of the NY Bight								C/P-2					
Conf & Proc: Mid-Atlantic Bight				E/C-1									
Breathholding Capacity								R/H-1					
Diving Response & Pulmonary Exchange											R/H-2		
NY Bight Education Activities									E/K-7				

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	-	-	-	-	3	3	3	7	5	3	6	5	4
Percentage of pledged match	-	-	-	-	4	4	4	6	1	5	5	4	6
Percentage of total projects in year	-	-	-	-	3	3	2	6	7	2	5	4	3
Number of participating faculty	-	-	-	-	1	1	1	3	4	2	4	3	2
Disciplines of participating faculty	-	-	-	-	LAW	LAW	LAW	LAW MED ADM	LAW CHEM BIOL	LAW	MED LAW	MED LAW	LAW
Research Publications - Articles	-	-	-	-	-	-	-	-	-	-	1	-	-
Reports	-	-	-	1	1	-	-	-	-	1	-	-	2
Popular	-	-	-	-	-	-	-	-	-	-	-	-	1
Other	-	-	-	-	1	-	-	2	1	-	-	-	-
Extension Effort-FTE - Marine	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	-	-	-	-	-	-	-	-	-	-	-	-	-
Extension Outreach - Publications	-	-	-	-	-	-	-	-	-	-	-	-	-
Information Pieces	-	-	-	-	-	-	-	-	-	-	-	-	-
Audio-Visual	-	-	-	-	-	-	-	-	-	-	-	-	-
Newsletter	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Participating Students	-	-	-	11	19	20	23	12	6	5	6	13	4
Theses Produced	-	-	-	-	9	7	13	5	1	1	-	1	-

## Research: Program Support

### Program Element: Program Support

**What:** Research in fields which contribute to other Sea Grant sponsored programs. Coastal law and underwater physiology are the disciplines involved to date. **Why:** Many research programs sponsored by the Sea Grant Institute raised legal and policy questions. Formation of the coastal law program was seen as a means of addressing a diversity of large and small problems raised. SUNY at Buffalo has unparalleled staff and facilities for studies of underwater physiology. Understandings of human physiologic response to underwater situations is basic as direct involvement of the scientist and underwater research grows. **Outcome:** Coastal law studies have provided many aspects of Sea Grant research with an underpinning and understanding they would not otherwise have had. The coastal law program is providing leadership to Sea Grant legal programs nationally.

The coastal law program grew out of Professor Reis' participation as a co-principal investigator in several research projects. Its concept was to develop means for providing legal research in support of the Institute's other research programs. A decision was taken, in the formulation of the concept, to limit the scope of the program to the coastal region, leaving international law to the many other institutions so involved. In its first form, the coastal law program had heavy educational content (up to ten law scholars were involved in a given summer--see Coastal Law Scholars in Education and Training). Then, with maturity, participation by students was reduced as the principals became more involved in the program's products. Most recently the program has been re-oriented to provide general legal guidance in subjects identified by Sea Grant Extension Specialists. Thus the coastal law program was never seen as a "project" with a single problem in mind, but rather its principals have played the role of counselors to the Sea Grant program, sensing the needs of the program and developing its products from those cues. Examples are:

- o As Sea Grant research explored the use of coal wastes formulated into blocks for use in constructing artificial fishing reefs, the question arose if such use would constitute ocean dumping. Research suggested that the answer was "no." This finding was used by state and federal agencies in deciding to continue funding of the project.

- o As a first step in the Marine Biomass Project, the coastal law program investigated the legal regime in which marine biomass production would occur and made substantive recommendations to both the New York and national programs. Union jurisdictions affected by where biomass farms were sited became a matter of some interest to the Gas Research Institute leadership.

- o As the Sea Grant Institute took the initiative in aquaculture, it was clear that comprehensive legal research was needed on the role of state agencies, local governments and others in the leasing of underwater lands, a complex issue in New York because of colonial grants to local governments, and in regulatory authorities generally. Two comprehensive monographs by Professor Milton Kaplan were completed and their substance included in the Aquaculture Plan.

- o A national survey of waterfront building codes undertaken following an inquiry to Extension Specialist Stephen Lopez by New York City's Department of Ports and Terminals (which administers shore lands in New York City).

Products of the coastal law program have included the Law and Policy Journals, papers in Law Reviews and in journals not traditional for the legal profession, and monographs. Professor Reis and Staff Attorney Linda Reynolds

have provided leadership in the Sea Grant legal group forming under the aegis of the Sea Grant Association, and formed the first social science program within the International Association for Great Lakes Research.

New York Sea Grant's participation in underwater physiology research is no more problematic than National Sea Grant's role in this field of research. It seems clear that some level of involvement is necessary and desirable--but at what level of priority? In the 1970's the renowned physiologist Hermann Rann and his collaborator Edward Lanphier built extraordinary facilities at the College of Medicine, SUNY at Buffalo, for physiologic studies in aqueous situations. New York Sea Grant should have an involvement with a program led by a creative and productive scientist such as Claes Lundgren, present director of the facility. But support for the research is always at the margin--"if funds are available."

Lundgren's Sea Grant research has been on breath-hold diving. It has been productive and he is in the forefront of the field. A symposium on this subject sponsored jointly by Sea Grant and the Undersea Medical Society is being planned.

## Research: Program Support

Table R44. Project Titles

C/P-2	Editorial Services for "Perspectives of the Bight," a Book	Squires
E/C-1	A Conference: "The Middle Atlantic Continental Shelf and New York Bight"	Squires/ Steinberg
E/K-7	Cooperative MESA - New York Sea Grant Education Activities	Squires/ Kantrowitz/ Wise
R/H-1	Effect of Underwater Immersion on Breath-Holding Capacity	Lundgren
R/H-2	Diving Response and Pulmonary Gas Exchange in Man During 10-20 Meter Breath-Hold Dives	Lundgren/ Hickey
R/L-3	Problems in Coastal Law	Reis
R/L-4	New York City Waterfront Building Standards	Reis/ Kaplan
R/L-6	Studies in Coastal Law	Reis/ Kaplan

Table R45. Journal Articles

Abbott, D.

Bibliographic Update: Beach Access.

New York Sea Grant Law and Policy Journal, Vol. III, 1980.  
8000

Ascher, D.

The Acquisition of Development Rights in the Coastal Zone: An Alternative to  
Wetlands Regulation.

New York Sea Grant Law and Policy Journal, Vol. II, 1978.  
7800

Barber, J.; Webb, P.

Irondequoit Bay Development Planning: Some Implications for Institutional  
Reform.

New York Sea Grant Law and Policy Journal, Vol. II, 1978.  
7800

Behr, L.

Implementing Federal Consistency Under the Coastal Zone Management Act of  
1972.

New York Sea Grant Law and Policy Journal, Vol. III, 1980.  
8000



Berland, S.  
Toward the True Meaning of the Public Trust.  
Sea Grant Law Journal, Vol. 1, 1976.  
7600

Bottar, A.  
Coastal Processes and Change: Legal Implications.  
Sea Grant Law Journal, Vol 1, 1976.  
7600

Buchwald, A.  
Waste Heat Utilization from Thermal Power Plants in New York State.  
Sea Grant Law Journal, Vol. 1, 1976.  
7600

Buskus, M.  
Tort Liability and Recreational Use of Land.  
Buffalo Law Review, Vol. 28, No. 4, 1979.  
7900

Deveney, P.  
Title, Jus Publicum, and the Public Trust: An Historical Analysis.  
Sea Grant Law Journal, Vol. 1, 1976.  
7600

Friedman, P.  
Artificial Ocean Reefs from Coal Wastes: Legal Perspectives.  
New York Sea Grant Law and Policy Journal, Vol. III, 1980.  
8000

Krauss, G.  
Water Resources Management in Ohio: 1830-1860.  
New York Sea Grant Law and Policy Journal, Vol. III, 1980.  
8000

Lopkin, W.  
Bibliography Update: The Seaward Delimitation of Boundary Lines and Ocean  
Resource Development.  
New York Sea Grant Law and Policy Journal, Vol. III, 1980.  
8000

Lopkin, W.  
Federal Regulation of Certain Bulk Hazardous Cargo: Focus on the Great Lakes.  
Buffalo Law Review, Vol. 28, No. 4, 1979.  
7900

Newton, G.  
Aquaculture: Emerging Issues of Law and Policy.  
New York Sea Grant Law and Policy Journal, Vol. II, 1978.  
7800

Niven, K.  
Beach Access: An Historical Overview.  
New York Sea Grant Law and Policy Journal, Vol. II, 1978.  
7800

**Research: Program Support**

**Novack, C.**

**Federal and State Controls over Land/Water Development in Navigable and Nonnavigable Waters.**

**Sea Grant Law Journal, Vol. 1, 1976.**

**7600**

**Piggush, J.**

**The NEPA Model for the Protection of Coastal Aesthetics: The View from the Courts.**

**Buffalo Law Review, Vol. 28, No. 4, 1979.**

**7900**

**Reis, R.**

**A Brief Inquiry into the Imperatives of the Coastal Zone and the Processes of Institutional Change.**

**Sea Grant Law Journal, Vol. 1, 1976.**

**7600**

**Sinclair, J.**

**Offshore Mineral Resource Exploitation: The State and Federal Response.**

**Sea Grant Law Journal, Vol. 1, 1976.**

**7600**

**Slonim, B.**

**Coastal Zone Resource Allocation: Some Legal and Economic Considerations.**

**Sea Grant Law Journal, Vol. 1, 1976.**

**7600**

**Stuart, J.**

**Judicial Decisionmaking and the Administration of Coastal Resources.**

**Sea Grant Law Journal, Vol. 1, 1976.**

**7600**

**Tung, G.**

**Jurisdictional Issues in International Law: Kelp Farming Beyond the Territorial Sea.**

**Buffalo Law Review, Vol. 31, No. 3, Fall 1982.**

**8200**

**Weinberg, R.**

**Coastal Zone Management Involving the Boundary Waters of New York and Ontario.**

**Sea Grant Law Journal, Vol. 1, 1976.**

**7600**

**Yawman, G.**

**State Boundary Extensions on the Continental Shelf.**

**New York Sea Grant Law and Policy Journal, Vol. II, 1978.**

**7800**

Table R46. Sea Grant Scholars/Theses

Current

Thomas Cassidy  
COASTAL LAW PROGRAM  
Douglas Trumpler  
COASTAL LAW PROGRAM

Graduated, Thesis Submitted\*

David Abbott  
BIBLIOGRAPHIC UPDATE:BEACH ACCESS  
7904  
David Ascher  
THE ACQUISITION OF DEVELOPMENT RIGHTS IN THE COASTAL ZONE: AN ALTERNATIVE TO  
WETLAND REGULATION  
7612  
Janice Barber  
IRONDEQUOIT BAY DEVELOPMENTAL PLANNING: SOME IMPLICATIONS FOR INSTITUTIONAL  
REFORM  
7612  
Lawrence Behr  
IMPLEMENTING FEDERAL CONSISTENCY UNDER THE COASTAL ZONE MANAGEMENT ACT OF  
1972  
8005  
Sanford Berland  
TOWARD THE TRUE MEANING OF PUBLIC TRUST  
7512  
Gary Borek  
DREDGING AND FILLING IN THE GREAT LAKES:PUBLIC CONTROL  
7901  
David Brody  
REGIONAL PLANNING BOARDS:STATE AND FEDERAL LEGISLATION ENACTING AND  
EMPOWERING THEM  
7712  
Edward Brown  
FROZEN ASSETS:PROPERTY INTERESTS IN THE ICE COVER OF THE GREAT LAKES AND ST.  
LAWRENCE RIVER  
8012  
Kevin Brown  
TIDAL WETLANDS BOUNDARIES  
8112  
Ave Buckwald  
WASTE HEAT FROM THERMAL POWER PLANTS IN NEW YORK STATE  
7512  
Michael Buskus  
TORT LIABILITY AND RECREATIONAL USE OF COASTAL LAND  
7812  
Gerald Citera  
FEDERAL PRESENCE IN THE GREAT LAKES  
7812

**Research: Program Support**

**Melanie Cyganowski**

**NOTE ON STATE LEGISLATION FOR WATER DEPENDENT USE REGULATION**

**7912**

**Patrick Deveney**

**TITLE, JUS PUBLICUM AND THE PUBLIC TRUST: A HISTORIC ANALYSIS**

**7512**

**William Dewart**

**STATE AND LOCAL RELATIONS IN THE COASTAL ZONE**

**7512**

**Theodore Firetog**

**THE INTERNATIONAL LEGAL ASPECTS OF THE ICONN PROJECT**

**7712**

**Arlene Fisk**

**THE NEGOTIATION/COOPERATION MODEL:A MEANS OF REGULATING DEVELOPMENT ALONG OUR COASTS**

**7712**

**Pepi Friedman**

**ARTIFICIAL REEFS FROM COALS WASTES:LEGAL PERSPECTIVES**

**7912**

**Michael Gottfried**

**REGULATION OF BULK HAZARDOUS CARGO ON THE GREAT LAKES**

**8311**

**Allen Klein**

**THE MEANING OF THE HIGH TIDE LINE**

**7612**

**Gene Krauss**

**WATER RESOURCES MANAGEMENT IN OHIO:1830-1860**

**7812**

**Wayne Lopkin**

**FEDERAL REGULATION OF CERTAIN BULK HAZARDOUS CARGO**

**7905**

**Philip McIntyre**

**IJC'S REGULATION OF WATER LEVELS IN THE GREAT LAKES**

**7812**

**Daniel Meyer**

**THE DUTY OF PLEASURE BOAT SKIPPERS TO CONSULT GOVERNMENT NAVIGATIONAL CHARTS:  
THE FOURTH CIRCUIT MAKES A WRONG TURN**

**7812**

**Mark Moretti**

**JURISDICTIONAL AND REGULATORY CONTROL OF OFFSHORE DEVELOPMENT PROJECTS**

**7709**

**Gary Newton**

**AQUACULTURE:EMERGING ISSUES OF LAW AND POLICY**

**7612**

**Katherine Niven**

**BEACH ACCESS: AN HISTORICAL OVERVIEW**

**7612**

**Katherine Novack**

**FEDERAL AND STATE CONTROLS OVER LAND/WATER DEVELOPMENT IN NAVIGABLE AND NON-  
NAVIGABLE WATER**

**7512**

**Ann Pfeiffer**

**AN EXAMINATION OF THE LEGAL IMPLICATIONS AND LEGISLATIVE REQUIREMENTS  
CONCERNING OIL POLLUTING HAZARDS IN RELATION TO ICONN**

**7712**

James Piggush

THE NEPA MODEL FOR THE PROTECTION OF COASTAL AESTHETICS:THE VIEW FROM THE COURTS

7612

James Sinclair

OFFSHORE MINERAL RESOURCE EXPLOITATION:THE STATE AND FEDERAL RESPONSE

7512

Bert Slonim

COASTAL ZONE RESOURCE ALLOCATION:SOME LEGAL AND ECONOMIC CONSIDERATIONS

7512

James Stuart

JUDICIAL DECISION MAKING AND THE ADMINISTRATION OF COASTAL RESOURCES

7512

Richard Troll

NEGOTIATION TECHNIQUES FOR RESOLVING LAND USE DISPUTES IN COASTAL AREAS

7812

Gea Tung

JURISDICTIONAL ISSUES IN INTERNATIONAL LAW: KELP FARMING BEYOND THE TERRITORIAL SEA

8304

Steven Waterman

A-95 REVIEW AND COASTAL ZONE PLANNING IN NEW YORK STATE

7712

Pamela Webb

IRONDEQUOIT BAY DEVELOPEMENT PLANNING; SOME IMPLICATIONS FOR INSTITUTIONAL REFORM

7712

Robert Weinberg

COASTAL ZONE MANAGEMENT INVOLVING THE BOUNDARY WATERS OF NEW YORK AND ONTARIO

7512

Gregory Yawman

STATE BOUNDARY EXTENSIONS ON THE CONTINENTAL SHELF

7712

\* Most students in this Program Element have been Coastal Law Scholars, whose degree requirements do not include a thesis. Prior to 1982, it was expected that Coastal Law Scholars would produce papers of a quality publishable in a law review. Many students' work was, in fact, published in the Sea Grant Law and Policy Journal. It is these articles whose titles are noted. In 1982, the production from the Coastal Law Program was redirected towards individual monographs, authored by one of the co-Directors of the Law Program. The work of individual Law Scholars since 1982 has generally been incorporated into these monographs.



**Research: Program Support**

**Status Uncertain**

Cheryl Block 7712  
Anthony Bossone 7612  
Anthony Bottar 7512  
Rosella Brevetti 8012  
Michael Crosby 8112  
David Eagen 8112  
Karen Edgel 7912  
Thomas Gick 8012  
Beth Ginsberg 8311  
Leonard Gulino 8303  
Janet Gunner 8303  
Bonnie Hager 7612  
Dennis Harkawik 7712  
Susan Harrington 7912  
Cheryl Heller 8012  
Roger Jones 8304  
Reed Kellner 7912  
Patrick Kelly 7912

Larry Kerman 7912  
Robert LaRussa 7605  
Ellen Lawson 8311  
Jeremy Nowack 7912  
Melanie Pierson 7912  
Glenn Pincus 8012  
Lydia Romer 7812  
Alan Ross 8311  
Judd Ryan 8112  
Barbara Schifeling 8304  
Karen Stifter 8112  
Jeffrey Taylor 8012  
Richard Trautwein 7812  
John Troll 7812  
Barbara Wagner 7912

Table R47. Sea Grant Scholars/First Occupation

David Abbott 7904 Attorney, Chicago law firm	Ave Buckwald 7512 Attorney, law firm, NYC
David Ascher 7804 Attorney, Cleveland law firm	Michael Buskus 7812 Judical Clerk, Rochester
Janice Barber 7612 Attorney, Buffalo law firm	Thomas Cassidy 8411
Laurence Behr 8005	Gerald Citera 7812 Attorney, a Buffalo law firm
Sanford Berland 7512 Judical Clerk, NYC	Michael Crosby 8112 Attorney, Rochester, NY
Cheryl Block 7712 Judical Clerk, NYC	Melanie Cyganowski 7912 Judical Clerk, NYC
Gary Borek 7901 Attorney, Buffalo law firm	Patrick Deveney 7512 Judical Clerk, NYC
Anthony Bossone 7612 Attorney, Buffalo law firm	William Dewart 7512 Attorney, Rochester law firm
Anthony Bottar 7512 Attorney, Syracuse law firm	David Eagen 8112 Attorney, NYC
Rosella Brevetti 8012 Attorney, Prentice-Hall, Paramus, NJ	Karen Edgel 7912
David Brody 7712	Theodore Firetog 7712 Envir. Law Inst., Washington, DC
Edward Brown 8012 Attorney, Baldwinsville, NY	Arlene Fisk 7712 Attorney, Philadelphia law firm
Kevin Brown 8112 JD program	Pepi Friedman 7912 Attorney, Buffalo law firm

**Research: Program Support**

Thomas Gick  
8012  
Attorney, US Justice Dept.,  
Washington, DC

Beth Ginsberg  
8311  
JD program, SUNY at Buffalo

Michael Gottfried  
8311  
JD program

Leonard Gulino  
8303  
US Bankruptcy Court, Buffalo, NY

Janet Gunner  
8303

Bonnie Hager  
7612  
Attorney, Buffalo law firm

Dennis Harkawik  
7712  
Attorney, NYC law firm

Susan Harrington  
7912

Cheryl Heller  
8012

Roger Jones  
8304  
Attorney, Buffalo, NY

Reed Kellner  
7912

Patrick Kelly  
7912  
Attorney, Buffalo Law firm

Larry Kerman  
7912  
Judicial Clerk, NYS Supreme Court in  
Rochester

Allen Klein  
7804  
Attorney, Rochester law firm

Gene Krauss  
7809  
PhD candidate, Harvard Law School

Robert LaRussa  
7812

Ellen Lawson  
8311  
Practicing Attorney

Wayne Lopkin  
7911  
Attorney, NYC law firm

Philip McIntyre  
7812

Daniel Meyer  
7812  
Assoc. Editor, Lawyers Coop.  
Publishing Co., Rochester

Mark Moretti  
7709  
Attorney, Rochester law firm

Gary Newton  
7612  
Attorney, Kalamazoo law firm

Katherine Niven  
7612

Katherine Novack  
7512  
Attorney, Labor Relations Board,  
Philadelphia

Jeremy Nowack  
7912  
Law Clerk, IRS, Washington, DC

Ann Pfeiffer  
7709  
Asst. Public Defender, Rochester

Melanie Pierson  
7912

James Piggush  
7612  
Judical Clerk, Kalamazoo, Michigan

Glenn Pincus  
8012  
Erie County District Attorney's  
Office

Lydia Romer  
7812  
Attorney, Presque Isle, Maine law  
firm

Alan Ross  
8311  
JD program, SUNY at Buffalo

Judd Ryan  
8112  
Legal Aid Society, NYC

Barbara Schifeling  
8304  
Attorney, Buffalo, NY

James Sinclair  
7512

Bert Slonim  
7512  
Teaching Fellow, Stanford Univ.

Karen Stifter  
8112  
Office of Chief Counsel, Internal  
Revenue Service, Washington, DC

James Stuart  
7512  
Attorney, Ramsey County, Minnesota

Jeffrey Taylor  
8012  
Attorney, Buffalo, NY

Richard Trautwein  
7812  
Judical Clerk, NYS Supreme Court,  
Rochester

Richard Troll  
7812  
Attorney, NYC law firm

John Troll  
7812

Douglas Trumpler  
8411

Gea Tung  
8304  
Office of General Counsel, Marine  
Midland Bank, Buffalo, NY

Barbara Wagner  
7912

Steven Waterman  
7709  
Judical Clerk, Tompkins County, NY

Pamela Webb  
7709  
Partner in Rochester law firm

Robert Weinberg  
7512  
Teacher, Davenport, Iowa

Gregory Yawman  
7712  
Judical Clerk, US District Court,  
Baltimore

Research: Recreation and Tourism

Table R48. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Public Access Problems				R/M-17									
Improving Recreational Access to GL						R/R-11	-----C						
Urban Neighborhoods & Rec. Uses					R/R-3	R/R-10							
NYC Beach Use and Constraints						R/R-9							
Waterfront Redevelopment								R/R-13					
Public Access to Waterfront									R/R-15				
Marina Businesses and Users		R/R-1	R/M-8										
Energy Adjustments of Comm Marinas				R/M-9									
Users of Rented Recreational Boats				R/M-15									
Supply & Demand for Rented Boats				R/M-16	-----C								
Marina Development in NYC								R/P-24	-----C				
Belting Materials for Mooring											R/X-1		
Marine Trades Eng. Professorship													R/A-22
Tourism Development on Great Lakes								R/R-12	-----C				
Energy Impact on Tourism Model									R/R-14	-----C			
Factors Affecting Tourism on GL										R/R-19	-----C		
Coastal Tourism Impact Evaluation													R/G-7
North East Regional Tourism Project													R/M-46
Learning by Doing & Coastal Recreation					R/R-4								R/R-26
GL Recreation Facility Design													



	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	-	3	4	4	2	4	2	2	4	4	2	-	2
Percentage of pledged match	-	2	2	4	2	2	2	2	5	3	2	-	0
Percentage of total projects in year	-	3	3	11	9	8	4	8	7	6	7	-	6
Number of participating faculty	-	2	3	4	3	4	2	5	7	5	6	-	3
Disciplines of participating faculty	-	REC	REC ECON	REC SOC	REC ECON PA	REC GEOG LA	REC CENG	REC GEOG EXT	REC GEOG PA ECON	ECON PA REC GEOG	REC GEOG MSENG	-	REC EXT ADM
Research Publications - Articles	-	-	-	-	1	1	2	2	4	1	1	2	-
Reports	-	-	-	1	3	1	1	2	4	-	1	-	-
Popular	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-
Extension Effort-FTE - Marine	0.1	0.7	0.7	0.8	1.2	1.0	1.5	1.0	1.6	1.6	1.6	1.6	2.4
Great Lakes	-	-	0.1	0.6	2.1	2.6	3.2	2.5	1.9	1.9	2.3	2.3	2.0
Extension Outreach - Publications	-	-	-	7	2	1	5	5	7	2	-	1	1
Information Pieces	-	1	2	-	1	-	3	1	-	1	-	3	-
Audio-Visual	-	-	-	-	-	-	-	-	-	-	2	-	1
Newsletter	-	-	-	-	-	-	-	-	-	-	X	-	-
Number of Participating Students	-	-	2	3	1	-	-	-	-	-	-	-	-
Theses Produced	-	-	-	1	1	-	-	-	-	-	-	-	-

## Research: Recreation and Tourism

### Program Element: Recreation and Tourism

**What:** Extension programs and research projects in support of community and regional recreation and tourism development. **Why:** Tourism and recreation based on coastal resources is a major national opportunity. In New York, older, well-established, coastal recreational opportunities are being rediscovered. Sea Grant is unique in its ability to assist community leaders to develop tourism opportunities and understand the values of the recreational resource base. **Outcome:** New York Sea Grant has gained a position of leadership in this field in both the northeast and the Great Lakes. New York's expertise has assisted other Sea Grant programs to develop competencies or to expand their activities. Major, new coastal recreation and tourism opportunities have developed in New York, particularly along the Great Lakes, largely through Sea Grant activities.

This program element has been led by Sea Grant Extension which has developed the expertise for its programming and identified most of the research directions. This is appropriate, for there is no discipline "recreation" or "tourism"--at least in New York institutions--and therefore no pool of talent from which ideas arise. While many research opportunities have been identified, finding appropriate talents, and developing interest in pursuing the research has been a major problem.

Recreation and tourism programming commenced on the Great Lakes coast where a developing salmonid fishery and a generally depressed economy created new opportunities for communities. Developing community response to those opportunities has been a major challenge for Sea Grant Extension. More recently, recreation and tourism programming has been expanded to the Marine District. This has not been without its problems, for an already thin cadre of researchers must be supplemented with new principal investigators.

In 1983, program leadership identified the pressing need for engineering assistance for Extension programming in recreation and tourism--particularly in respect to marinas, boatyards and other supporting services. In research, pragmatic engineering had long been sought (See Education and Training for the various student engineering projects attempted) in a variety of fields. Professor John Reilly, University of Maine at Orono, was brought in as a consultant, and with him, a proposed Sea Grant professor in marine trades was defined. The competition for the host campus for that professorship was concluded in spring, 1984, with the selection of Farmingdale Agricultural and Technical College. The position is now being advertised. The research agenda of this program element will be expanded with that addition.

Research in this program element began with marina and boatyard investigations and expanded to charter and other rental boats. Access questions, both in the more rural coastal areas and in urban situations, have been persistent. But most of these studies have been resource directed. More fundamental questions of the factors affecting tourism have only recently been addressed. Sportfishing, a major component of the coastal recreation economy, is not represented in this program element, being separated for convenience (see Program Element: Sportfishery).

While the Great Lakes coastal region has dominated both extension and research in this program element, there has been notable progress elsewhere. In the New York metropolitan area, beach use and constraints on marina development have

been examined. Use of small urban coastal parks and abandoned piers, potentially developed by community planning boards, has been investigated and successfully implemented through Extension programs.

New York Sea Grant has been among the leaders in this field of research. Certainly in the east and northeast, our Extension staff have provided much of the leadership for Advisory Services in other states. Recently, the northeastern Sea Grant directors identified regional tourism as a research priority and undertook the development of a regional project. That research was underway in the summer of 1984. Leadership in the development of the regional project rested heavily with New York Sea Grant affiliates--both Extension and research.

Nowhere in Sea Grant is the close coupling between research and extension more apparent than in recreation and tourism. Over half of the mini-grants<sup>1</sup> awarded have been in this program element. Many of these mini-grants have led to full research projects. Among those mini-grants have been:

- o Analysis of Leisure Home Patterns Along the St. Lawrence in Lisbon County
- o A Tourist Survey of the St. Lawrence River Region
- o Boating Facility Needs and Economic Impact of a Mature Salmonid Sportfishery for the Monroe, Niagara, Orleans and Wayne County Shorelines of Lake Ontario
- o An Analysis of Beach Use Data in the New York City Coastal Region
- o Analysis of Great Lakes Recreation/Tourism Futurescapes

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<sup>1</sup>Mini-grants are research awards made in support of extension programming. An Extension Specialist is responsible for the development of the research and its monitoring, in conjunction with the Institute. See Program Development Funds.  
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In addition to Extension programs assisting local communities, higher educational institutions can assist. Jefferson County Community College has a well developed tourism program including hospitality training. This program was developed, in part, with Sea Grant funds.

## Research: Recreation and Tourism

Table R49. Project Titles

R/A-22	Developing a Competency in Marine Trades Engineering: A Sea Grant Professorship	Squires/ Wilkins
R/G-7	Development of a More Comprehensive Evaluation of Coastal Tourism Impacts	Brown
R/M-9	Adjustments of Commercial Marinas and Boaters to the Energy Shortage	Brown
R/M-15	Traits of Users of Rented Recreational Boats	Carls
R/M-16	Supply of and Demand for Rented Recreational Boats in New York	Gratzer
R/M-17	Public Access Problems on the New York Coastline - The Case of Lake Erie	Larson
R/M-46	Assessing the Impacts of Coastal Tourism Product Mixes at the Local Level: A Northeastern Sea Grant Regional Proposal	Brown
R/P-24	The Potential for Small-Boat Marina Development in New York City	Heatwole/ West
R/R-1	Marina Businesses and Users in New York	Eiler/ Brown
R/R-3	Urban Neighborhoods and Recreational Uses of the Coastal Zone	Moss
R/R-4	"Learning by Doing" and Coastal Recreation	Smith
R/R-9	Beach Use and User Constraints in the New York City Coastal Region	Heatwole
R/R-11	Improving Recreational Access to the Great Lakes	Brown
R/R-12	Tourism Development Studies on the Great Lakes	Brown
R/R-13	An Assessment of Seven Waterfront Public Access Sites to Anticipate Their Potential for Development	Cook
R/R-14	An Energy Impact Model for New York Water-Related Recreation Activities	Arbel/ Grier/ Vankatesh
R/R-15	Public Access to the Urban Waterfront: A Behavioral Study to Establish Criteria for Development, Planning and Design	Cook
R/R-19	Factors Affecting Tourism on the Great Lakes Coast	Brown/ Brumsted

R/R-26	Recreational Facility Design and Environmental Impacts on the Great Lakes: A Developmental Proposal	Haynes
R/X-1	Engineering Evaluations of Belting Materials for Redesigned Mooring Systems	Franco/ Garcia

Table R50. Journal Articles

Arbel, A.; Ravid, S.  
The Differential Impact of Gas Shortages and Fuel Price Increases on Demand:  
The Case of the Hotel Industry in New York State.  
The Energy Journal, Vol. 4, No. 2, 1983.  
8300

Arbel, A.; Ravid, A.  
An Industry Energy Price Impact Model: The Case of the Hotel Industry.  
Applied Economics, Vol. 15, 1983.  
8300

Brown, T.  
Regional Economics of Michigan's Salmonid Program: Does a \$20 Million Fishery  
Really Make a Difference?  
Symposium Proceedings; Michigan Tourism; How Can Research Help?,  
9 September 1981.  
8200

Brown, T.; Decker, D.  
Access to Great Lakes Salmonid Fishing Via Private Lands: A Study of Riparian  
Landowners.  
Recreation Impacts: The Great Lakes Ecosystem. Ontario Research Council on  
Leisure, Monograph 1, August 1979.  
7900

Carls, E.  
Comparative Characteristics of Surf Fishermen and Boat Fishermen on Long  
Island, NY.  
New York Fish and Game Journal, Vol.27, No.1, January 1980.  
8000

Deyak, T.; Smith, V.  
Congestion and Participation in Outdoor Recreation: A Household Production  
Function Approach.  
Journal of Environmental Economics and Management, Vol. 5, 1978.  
7800

Heatwole, C.; West, N.  
Mass Transit and Beach Access in New York City.  
Geographical Review, April 1980.  
8000



**Research: Recreation and Tourism**

**Heatwole, C.; West, N.**

**Race, Income and Attitude Toward Beach Cleanliness.  
Coastal Zone '80, Vol. II, 1980.**

**8000**

**Heatwole, C.; West, N.**

**Storage Characteristics of New York's Recreational Fleet.  
Proceedings of the Middle States Division, Association of American  
Geographers, Rochester, NY, 16 October 1981.**

**8100**

**Munley, V.; Smith, V.**

**A Note on Learning-By-Doing and Willingness-To-Travel.  
The Annals of Regional Science, Vol.11, No.3, 1977.**

**7700**

**Munley, V.; Smith, V.**

**Learning- by- Doing and Experience: The Case of Whitewater Recreation.  
Journal of Land Economics, Vol. 52, No. 4, 1976.**

**7600**

**Smith, V.; Munley, V.**

**The Relative Performance of Various Estimators of Recreation Participation  
Equations.**

**Journal of Leisure Science, Vol.10, No.3, 1978.**

**7800**

**West, N.; Heatwole, C.**

**A Concept for Developing an Urban Waterfront Data Informational System.  
Papers from the Annual Conference of the Urban and Regional Information  
Systems Association, Toronto, Canada, 17 August 1980.**

**8000**

**West, N.; Heatwole, C.**

**Urban Beach Use: Ethnic Background and Socio-Environmental Attitudes.  
NYSGI.**

**7900**

Table R51. Sea Grant Scholars/Theses

Current

NONE

Graduated, Thesis Submitted

Regina Bresnan

SURVEY OF LONG ISLAND SURF FISHERMAN, 1975

7512

James Murray

# THE CHARTER BOAT INDUSTRY OF NEW YORK STATE: A PROBLEM ANALYSIS

7505

Thesis Not Related to Sea Grant

Michael Voiland 7605

Table R52. Sea Grant Scholars/First Occupation

Regina Bresnan

7512

Master's candidate, Univ. of Maryland

George Kronman

7712

James Murray

7505

Director, UNC Sea Grant Marine Advisory Service

Edward Stander

7808

Michael Voiland

7605

Extension Specialist, NY Sea Grant Extension Program

R-101

Percentage of federal	
Percentage of pledged	
Percentage of total	
Number of participants	
Disciplines of participants	
Research Publications	
Extension Effort-FTE	
Extension Outreach - F	
Number of Participants	
Theses Produced	

R-103



## Research: Seafood Technology

Table R53. Program Element Summary

84

## Research: Seafood Technology

Program Element: Seafood Technology and Marketing

**What:** A research team conducting a full range of seafood related research has been assembled and institutionalized. **Why:** Cornell University's strength in food science offered an opportunity for New York Sea Grant to make a national contribution. **Outcome:** Significant research, much of it in collaboration with industry, has been carried out. The existence of the research group was of unmeasurable benefit in assisting the Port Authority of New York and New Jersey in its Fishport development. A NYS Seafood Technology Laboratory is being funded, with a base in Brooklyn close to Fishport.

This Program Element began in what many would view as the "classic" Sea Grant fashion: In 1972, a Program development grant was made to Professor Robert Baker, then Director of the Food Science Institute of Cornell's College of Agriculture and Life Sciences. The funds were used to support a seminar series introducing Cornell's food scientists to seafoods and seafood marketing.

In time a strong seafood science program developed. The program has had four major components: Shelflife extension of seafood products; new product development and market testing; basic nutritional science, especially dealing with lipid chemistry; and, utilization of processing waste streams. In its first years, the Sea Grant Institute pressed researchers to work with New York State processing firms as the Sea Grant program sought to establish itself in the state. Since then the seafood group has worked with the seafood industry on a national basis.

A weakness of the seafood team has been the few additional faculty who have been brought into the group. This is both a reflection of the difficulty in interesting faculty in a foodstuff so relatively distant from their laboratories and limitations of Sea Grant funding. The number of faculty involved in seafood research may be increased with the addition of two faculty lines to the Department of Food Science through funding for the New York Seafood Technology Laboratory.

The seafood program has maintained good relationships with both the Gloucester Seafood Technology Laboratory of NMFS and the Mid-Atlantic Fishery Development Foundation. An annual two-day seminar involving all faculty and Sea Grant Scholars in seafood science (and other graduate students working on seafoods as well) has been held in the between-semesters break. Gloucester Laboratory staff have participated, presenting reports of active research at that laboratory. In 1984, the program was further broadened to include representatives from the Port Authority of New York and New Jersey's Fishport project and the NYS Departments of Agriculture and Markets and State (Coastal Management Program). Mid-Atlantic Fishery Development Foundation funds have been awarded to members of this group for research support.

The relationship between Cornell's seafood scientists and the Gloucester Laboratory may be formalized with a Cooperative Agreement. A new draft of such a document will be submitted to the Northeast Regional Director, NMFS, this year.

A major new opportunity for collaborative research with industry may arise from the formation of the NYS Seafood Technology Laboratory, a cooperative activity of Cornell University and City University of New York, Kingsborough Community College. This entity arose from an expressed desire of Cornell

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Michael Voiland

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Extension Specialist, NY Sea Grant Extension Program

Table R53. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Composition and Role of Fish Lipids					R/T-10				C				
Nutritional Value & Quality of Fish										R/T-24			
Lipids & Quality Attributes of Fish						R/T-14						R/T-29	C
Rapid Determination of Protein Qual							R/T-17	T					
Detection of Microbial Growth													
New Convenience Foods From Minced Fish			R/T-3		R/T-8				C				
Market Potential for New Products					R/T-11				C				
Underused Fish for Convenience Foods										R/T-19			
Non-traditional Fish for New Foods												R/T-26	C
Shelf-Life Ext: Underused Fish										R/T-21			
Film Packaging: Shelf Life Extension												R/T-26	C
Shelf-Life Ext: Fresh & Frozen Fish												R/T-28	C
Use of Clam By-Products		R/A-3	R/T-4	C									
Reclaiming Clam Wash Protein & Flavor				R/T-6	C								
Recovery and Use of Protein						R/T-13			C				
By-product Recovery & Handling Tech										R/T-22	C		
Industrial Enzymes from Clam Viscera												R/T-30	
Criteria of Consumer Fish Selection												R/T-31	



	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	-	1	4	6	6	7	7	7	4	3	3	5	4
Percentage of pledged match	-	1	5	9	9	10	10	11	9	7	5	8	9
Percentage of total projects in year	-	3	6	8	11	12	9	10	7	8	10	13	11
Number of participating faculty	-	1	3	4	5	6	7	8	7	10	7	9	6
Disciplines of participating faculty	-	FS	FS CHEM	FS CHEM	FS ECON	FS ECON	FS ECON	FS ECON	FS	FS	FS	FS N	FS
Research Publications - Articles	-	-	-	-	2	5	5	5	3	7	5	9	4
Reports	-	-	-	-	2	3	1	5	3	4	2	1	-
Popular	-	-	-	1	-	-	4	-	-	-	1	-	-
Other	-	-	-	-	-	-	-	-	-	1	-	-	-
Extension Effort-FTE - Marine	-	0.2	0.2	0.2	0.2	0.4	1.3	1.0	1.1	2.1	2.2	2.2	2.3
Great Lakes	-	-	-	-	0.5	0.8	0.4	0.2	0.1	0.1	0.1	0.1	0.1
Extension Outreach - Publications	-	-	-	-	-	-	1	-	-	-	-	-	-
Information Pieces	-	-	1	1	-	-	-	-	-	-	-	1	1
Audio-Visual	-	-	-	1	-	2	-	-	1	-	-	-	-
Newsletter	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Participating Students	-	-	1	8	10	10	10	10	11	12	11	11	9
Theses Produced	-	-	-	1	1	3	1	1	3	3	2	2	1

## Research: Seafood Technology

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researchers for a field station in closer proximity to the marine environment than Ithaca. Sea Grant played a central role in the development of this program and in negotiating the relationship between Cornell and CUNY. Kingsborough Community College, which is developing CUNY's new marine program, is located a short distance from Fishport, and will provide facilities for the laboratory. The director and staff of the laboratory will be from Cornell's Food Science Department. An initial State appropriation of \$500,000 has provided for rehabilitation of a laboratory building, two faculty positions and some equipment. Additional funding is being provided by capital construction funds of CUNY.

In the 1983-84 Legislature, alterations in the Agriculture and Markets Law made possible a greater involvement of that Department in seafoods and seafood marketing. The Sea Grant Institute had a major role in the development of that legislation. Already the involvement of that Department in marketing programs has had a beneficial effect.

Several years ago, challenged by a former NMFS Regional Director who felt that Sea Grant Extension did little for NMFS, New York Sea Grant established a Seafood Technology Extension position. A significant portion of that Specialist's time is devoted to northeast regional programming and with improving relations between the Northeastern Regional Laboratories, industry and Sea Grant. The investment is beginning to show benefits.

Better utilization of seafoods through reduction of protein and flavor ingredients from the waste stream, development of new products from non-traditional species, and isolation of valuable chemicals as by-products has been especially beneficial to industry. New products research has value in training, for most industry food scientists engaged in this type of work, but the research has given visibility to the program. Some of this research provides natural transitions to the Institute's developing biotechnology program.

Basic research in fish lipids has become of great popular interest because of the possible utility of some lipids in heart therapy. Professor Kinsella, awarded a General Foods Professorship this year, will be, with Sea Grant sponsorship, developing a national conference on fish lipids: their sources and production. (Further Sea Grant sponsored research on fish lipids is discussed in Program Element: Aquaculture and Natural Products.)

## Research: Seafood Technology

Table R54. Project Titles

R/A-3	Use of Clam By-Products	Shallenberger
R/T-3	Utilization of Filleting Waste from Flounder Processing	Baker/ Darfler
R/T-6	Reclamation of Protein and Flavor Materials from Clam Wash Water	Hood
R/T-10	Lipids: Their Composition and Role in Determining Quality of Fish Products	Kinsella
R/T-11	Market Potential for New Processed Fish and Shellfish Products	Goodrich
R/T-13	Recovery and Utilization of Protein and Other Nutrients from Seafood Processing Wastes	Hood/ Zall
R/T-14	Rapid Determination of Protein Quantity and Quality in Fish Products	Sherbon
R/T-17	Detection of Microbial Growth and Activity in Seafoods and Seafood Products	VanDemark
R/T-19	Potential of Different Underutilized Species of Fish for Convenience Foods	Baker/ Regenstein
R/T-21	The Shelf-Life Extension of Underutilized Fish	Regenstein/ Baker
R/T-22	By-Product Recovery and Improved Technologies for Seafood Handlers and Processors	Hood/ Zall
R/T-24	Nutrients, Nutritional Value and Quality of Fish and Seafoods	Kinsella/ Baker/ Bruckner/ Shetty
R/T-26	Potential of Selected Non-Traditional Species of Fish and Other Seafood for Convenience Foods	Baker/ Kline
R/T-27	Thermostabilization of Fresh Fish Packaged in Polymeric Films: A New Approach to Shelf-Life Extension	Rizvi
R/T-28	Shelf-Life Extension of Fresh and Frozen Fish	Regenstein
R/T-29	Role of Lipids in Nutritional and Quality Attributes of Seafoods	Kinsella/ Bruckner
R/T-30	By-Product Recovery and Improved Technologies for Seafood Handlers and Processors	Zall

R/T-31    The Role of Quality, Nutritive Value; and Other  
          Evaluative Criteria in Consumer Seafood Decisions

Bisogni/  
Ryan



## Research: Seafood Technology

### Table R55. Journal Articles

Audley, M.; Shetty, K.; Kinsella, J.

Isolation and Properties of Phospholipase A From Pollock Muscle.

Journal of Food Science, Institute of Food Technologists: Vol. 43, 1978.

7800

Baker, R.

The Problem of Food Waste.

New York's Food and Life Sciences Quarterly, Vol. 11. No. 2, 1978.

7800

Chia, S.; Baker, R.; Hotchkiss, J.

Quality Comparison of Thermoprocessed Fishery Products in Cans and Retortable Pouches.

Journal of Food Science, Vol. 48, No. 5, 1983.

8300

Damodaran, S.; Kinsella, J.

The Effects of Neutral Salts on the Stability of Macromolecules.

Journal of Biological Chemistry, Vol.256, No.7, 10 April 1981.

8100

Damodaran S.; Kinsella, J.

Binding of Carbonyls to Fish Actomyosin.

Journal of Agricultural and Food Chemistry, Vol. 31, No. 4, 1983.

8300

Fey, M.; Regenstein, J.

Extending Shelf-Life of Fresh Water Red Hake and Salmon Using CO<sub>2</sub>

Modified Atmosphere & Potassium Sorbate Ice at 1 Degree C.

Journal of Food Science, Vol.47, 1982.

8200

Groner, L.; Regenstein, J.

Considerations....of Tempering with Microwave Technology. Parts I and II.

Seafood America, Vol. 2, No. 3, March/April 1982; Vol. 2, No. 4, July/August 1982.

8200

Hood, L.; Zall, R.; Conway, R.

Conversion of Minced Clam Wash Water into Clam Juice: Waste Handling or Product Development?

Food Product Development, November 1976.

7600

Jauregui, C.; Baker, R.

Discoloration Problems in Mechanically Deboned Fish.

Journal of Food Science, Vol.45, No.4, 1980.

8000

Kanner, J.; Kinsella, J.

Lipid Deterioration Initiated by Phagocytic Cells in Muscle Foods: B-Carotene Destruction by a Myeloperoxidase-Hydrogen Peroxide-Halide System.

Journal of Agricultural and Food Chemistry, Vol. 31, No. 2, 1983.

8300

Kanner, J.; Kinsella, J.

Lipid Deterioration: B-Carotene Destruction and Oxygen Evolution in a System Containing Lactoperoxidase Hydrogen Peroxide and Halides.

Lipids, Vol. 18, No. 3, 1983.

8300

Kanner, J.; Kinsella, J.

Initiation of Lipid Peroxidation by a Peroxidase/Hydrogen Peroxide/Halide System.

Lipids, Vol. 18, No. 3, 1983.

8300

Kelleher, S.; Zall, R.

Ethanol Accumulations in Muscle Tissue as a Chemical Indicator of Fish Spoilage.

Journal of Food Biochemistry. Vol. 7, 1983.

8300

Kinsella, J.; Shimp, L.; Mai, J.

The Proximate and Lipid Composition of Several Species of Freshwater Finfishes.

New York's Food and Life Sciences Bulletin, No. 69, 1978.

7800

Kinsella, J.; Shimp, J.; et al.

Sterol, Phospholipid, Mineral Content and Proximate Composition of Filets of Select Freshwater Fish Species.

Journal of Food Biochemistry Vol. 1, 1977.

7700

Kinsella, J.; Shimp, J.; et al.

Fatty Acid Content and Composition of Freshwater Finfish.

Journal of the American Oil Chemists' Society, Vol. 5, 1977.

7700

Knorr, D.; Regenstein, J.

A Simple Method for Evaluating Textural Changes of Frozen Fish Minces.

Journal of Food Science. Vol. 48, No. 1, 1983.

8300

Laird, W.; Mackie, I.; Regenstein, J.

Deterioration of Frozen Cod and Haddock Minces.

Meeting of IIR Commissions, International Institute of Refrigeration, 2 August 1981.

8100

**Research: Seafood Technology**

**Liu, P.; Lozano, J.; Pantazaras, N.**

**An Asymptotic Theory of Combined Wave Refraction and Diffraction.**  
**Applied Ocean Research, Vol. 1, No. 3, 1979.**

**7900**

**Mai, J.; Kinsella, J.**

**Changes in Lipid Composition of Cooked Minced Carp (CYPRINUS CARPIO) During Frozen Storage.**

**Journal of Food Science, Vol. 44, No. 6, 1979.**

**7900**

**Mai, J.; Shimp, J.; et al.**

**Lipids of Fish Fillets: Changes Following Cooking by Different Methods.**

**Journal of Food Science, Vol. 43, 1978.**

**7800**

**Mai, J.; Goswami, S.; et al.**

**A New Prostaglandin, C22-PGF<sub>4a</sub>, Synthesized from Docosahexenoic Acid C22:6n<sub>3</sub> by Trout Gill.**

**Prostaglandins, Vol. 21, No. 5, May 1981.**

**8100**

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**Effects of Microwave Cooking on Food Fatty Acids: No Evidence of Chemical Alteration or Isomerization.**

**Journal of Food Science, Vol. 45, No. 6, 1980.**

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**Lipid Composition of Dark and White Muscle from White Sucker CATOSTOMUS COMMERSONI.**

**Journal of Food Science, Vol. 44, 1979.**

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**Composition of Lipids and Proteins of Deboned Minced and Filleted White Sucker (CATOSTOMUS COMMERSONI).**

**Journal of Food Biochemistry, Vol.3, 1979.**

**7900**

**Moledina, K.; Regenstein, J.; et al.**

**A Process for the Preparation of Dehydrated Salted Fish Soy Cakes.**

**Journal of Food Science, Vol.42, No.3, 1977.**

**7700**

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**Effects of Antioxidants & Chelators on the Stability of Frozen Stored Mechanically Deboned Meat for Racks after Filleting.**

**Journal of Food Science, Vol. 42, No. 3, 1977.**

**7700**

**Raccach, M.; Baker, R.**

**Microbial Properties of Mechanically Deboned Fish Flesh.**

**Journal of Food Science, Vol.43, 1978.**

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Effect of Heat and Additives on the Shelf-Life of Frozen Red Hake.  
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The Cornell Experience with Minced Fish.  
Advances in Fish Science and Technology, Fishing News Books, Ltd, England,  
1981.  
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Regenstein, J.; Jauregui, C.; Baker, R.  
The Effects of pH, Polyphosphates and Different Salts on Water Retention  
Properties of Ground Trout Muscle.  
Journal of Food Biochemistry, Vol. 8, 1984.  
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Utilization of Red Hake.  
Marine Fisheries Review, January 1980.  
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The Shelf-Life Extension of Fresh Fish.  
Applied and Environmental Microbiology, Vol.37, No.3, 1981.  
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Regenstein, J.; Schlosser, M.; et al.  
Chemical Changes of Trimethylamine Oxide During Fresh and Frozen Storage of  
Fish.  
Chemistry and Biochemistry of Marine Food Product, Martin et al., eds., 1982.  
8200

Regenstein, J.; Noyes, O.  
University Involvement in the Commercialization of New Products.  
Food Technology, September 1982.  
8200

Regenstein, J.  
What is Fish Quality?  
Infish Marketing Digest, No.6, 1983.  
8300

Regenstein J.  
The Shelf-Life Extension of Haddock in Carbon Dioxide-Oxygen Atmospheres with  
and without Potassium Sorbate.  
Journal of Food Quality, Vol.5, 1982.  
8200

Welsh, F.; Zall, R.  
Fish Scales: A Coagulating Aid for the Recovery of Food Processing Water  
Colloids.  
Process Biochemistry, August 1979.  
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Research: Seafood Technology

Welsh, F.; Zall, R.

Using Zeta Potential to Optimize Coagulating Aid Dose Used to Treat Food Processing Wastes.

Process Biochemistry, June/July 1981.

8100

Welsh, F.; Zall, R.

An Ultrafiltration Activated Carbon Treatment System for Renovating Fishery Refrigeration Brines.

Canadian Institute of Food Science and Technology Journal, Vol. 17, No. 2, 1984.

8400

Welsh, F.; Zall, R.

Use of a Model Scale System for Recycling Spent Fishery Brines.

Journal of Food Protection, Vol. 46, No. 12, December 1983.

8300

Yang, T.; Zall, R.

Absorption of Metals by Natural Polymers Generated from Seafood Processing Wastes.

I & EC Product Research and Development, Vol. 23, No. 1, 1984.

8400

Yang, T.; Zall, R.

Chitosan Membranes for Reverse Osmosis Application.

Journal of Food Science, Vol. 49, No. 1, 1984.

8400

Zall, R.; Cho, I.

Production of Edible Foods from Surf Clam Wastes.

Transactions of the American Society of Agricultural Engineers, Vol.20, No.6, 1977.

7700

Zall, R.; Hood, L.; et al.

Reclamation and Treatment of Clam Wash Water.

Proceedings of the First International Congress on Food Processing Wastes, December 1976.

7600

Zall, R.; Jordan, D.; et al.

Using Winter Coldness to Provide Refrigeration.

Transactions of the American Society of Agricultural Engineers, Vol.24, No.4, 1981.

8100



Table R56. Sea Grant Scholars/Theses

Current

- \*Hung-Chang Chen  
CONTINUOUS ETHANOL FERMENTATION SYSTEMS USING ATTACHED FILM EXPANDED BED  
REACTORS
- \*James Daniels  
EXTRACTION OF SUBSTANCES FROM FISH WASTES USING SUPERCRITICAL FLUID  
EXTRACTION TECHNOLOGY
- \*Rudolf Hsieh  
FISH LIPID OXIDATION AND METABOLISM  
Michael Jahncke  
QUALITY PROBLEMS ASSOCIATED WITH MINCED FISH FROM RACKS
- \*Byung Kim  
FERMENTATION OF SEAFOOD WASTE
- \*Maria Dulce C. Paredes  
SHELF LIFE OF THREE SPECIES OF CANNED FISH
- \*Karl Ragnarsson  
TEXTURAL AND WATER RETENTIONAL CHANGES IN FROZEN GADOID FISH
- \*Luis Toledo-Flores  
AN IMPROVED PROCEDURE FOR HOLDING ROUND PINK SHRIMP (PANDALUS JORDANI) POST-  
CATCH

Graduated, Thesis Submitted

- Michael Audley  
ISOLATION AND PROPERTIES OF PHOSPHOLIPASE FROM POLLOCK MUSCLE  
7705
- Il Joo Cho  
CLEANING SURF CLAM MEAT FROM ITS PROCESSING WASTE  
7705
- \*Michael Fey  
EXTENDING THE SHELF-LIFE OF FRESH FISH BY POTASSIUM SORBATE AND MODIFIED  
ATMOPHERES AT 0-1 CELSIUS  
7905
- Kathleen Hefner  
EVALUATION OF FISH PROTEIN IN MILK REPLACERS FOR CALVES  
8105
- Win Hung  
FACTORS AFFECTING THE TEXTURAL PROPERTIES OF EMULSION PRODUCTS USING  
MECHANICALLY-DEBONED FISH  
7705
- \*Stanley Jar  
COMPARISON OF CHEMICAL, PHYSICAL & SENSORY PROPERTIES OF RAINBOW  
TROUT, POLLOCK & SHRIMP PROCESSED IN CANS & RETORTABLE  
8205
- \*Carlos Jauregui  
EFFECTS OF POLYPHOSPHATES ON THE WATER BINDING PROPERTIES OF MUSCLE PROTIENS  
8005
- \*Yong Keun Joh  
PREPARATION OF CLAM FLAVORING INGREDIENT FROM CLAM WASH WATER  
7805

## Research: Seafood Technology

Stephen Kelleher

A THERMAL TREATMENT FOR THE EXTENSION OF FRESH FISH SHELF-LIFE  
8105

\*Bethia Margoshes

THE REMOVAL OF THE SAND VEIN FROM BAY SCALLOPS  
8105

\*Kabir Moledina

EFFECT OF SOME TREATMENTS ON QUALITY OF FROZEN;STORED;MECHANICALLY DEBONED  
FLOUNDER MEAT AND ITS USE IN PREPARATION OF FISHCAKE  
7605

\*Robert Morris

PRODUCT DEVELOPMENT AND NUTRITIONAL EVALUATION OF UNDERUTILIZED SPECIES  
7505

Susan Pettigrew

PREPARATION AND PROPERTIES OF FISH BROTH MADE FROM FLOUNDER RACKS  
8005

\*Allan Samson

TEXTURAL CHANGES IN FROZEN GADOID MINCES  
8305

\*Zwi Weinberg

HEAT INITIATED BINDING IN FISH  
8208

\*Frank Welsh

FISH SCALES:A COAGULATION AID TO RECOVER COLLOIDAL SOLIDS IN FOOD PROCESSING  
WASTEWATER  
8005

\*Tony Yang

REMOVAL OF HEAVY METALS FROM LIQUIDS USING CHITOSAN AND FISH SCALES  
8312

### Status Uncertain

James Brenna 8212

\*Woei-Jong Liu 8308

\*Jimbin Mai 8105

Alberto Pedrosa 8407

\*Damodaran Srinivasan 8105

\*Joy Swanson-Parker 8312

### Did Not Graduate

\*Ling-Yun Ma 8205

Duane Charbonneau 7905

\*William Friedrich 7812

\*Moshe Raccah 7805

\*Doctoral Candidate

Table R57. Sea Grant Scholars/First Occupation

Ling-Yun Ma 8205 MBA program, Univ. of California	Michael Jahncke 8412
Michael Audley 7705 Alpha Laval Food Eng. Service, NJ	Stanley Jar 8205 Faculty, Food Science Dept., Univ. of Taiwan
James Brenna 8212 PhD candidate, Chemistry, Cornell	Carlos Jauregui 8005 New Product Dev., Proctor & Gamble, Inc.
Duane Charbonneau 7905	Yong Keun Joh 7802 Kelco Corp., NJ
Hung-Chang Chen 8408	Stephen Kelleher 8105 Consulting firm, Nova Scotia
Il Joo Cho 7705 Flavor research at Firmenich Inc., NJ	Byung Kim 8412
James Daniels 8412	Woei-Jong Liu 8308
Michael Fey 7905 Product Dev. at Proctor & Gamble, Cincinnati	Jimbin Mai 8105 Project Leader, Research Unit, Nestle, Inc.
William Friedrich 7812	Bethia Margoshes 8105 Proctor and Gamble, Inc.
Kathleen Hefner 8105 PhD candidate, Veterinary Medicine, Cornell	Kabir Moledina 7605 PhD candidate, Univ. of Alberta
Rudolf Hsieh 8412	Robert Morris 7505 Agency for International Dev., Washington, DC
Win Hung 7705	Maria Dulce C. Paredes 8412

**Research: Seafood Technology**

**Alberto Pedrosa**  
8407

**Susan Pettigrew**  
8005  
Flavor Research, T.J. Lipton, NJ

**Moshe Raccah**  
7805  
Microlift Technologies, Sarasota, FL

**Karl Ragnarsson**  
8412

**Allan Samson**  
8305  
Research, Hebrew National, Inc., NYC

**Damodaran Srinivasan**  
8105  
Assistant Professor, Food Chemistry,  
Univ. of Wisconsin

**Joy Swanson-Parker**  
8312  
PhD candidate, Food Sciences, Cornell

**Luis Toledo-Flores**  
8412

**Zwi Weinberg**  
8208  
Staff, Inst. of Technology, Univ. of  
Haifa, Israel

**Frank Welsh**  
8005  
Consulting firm, Nova Scotia

**Tony Yang**  
8312

Table R58. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Coastal Current & Transport Studies						R/M-26							
Wave Refraction and Diffraction													
Geomorphology South Shore Long Island	R/U-2	R/C-7	R/M-1							R/M-34		R/K-2	
Coastal Inventory of the Peconics		R/C-8											
Stabilization of Subtidal Sediments				R/M-14									
Mobilization of Metals by Eelgrass						R/M-24							
Bluff Erosion North Shore LI									R/M-33				
Tech Control of Beach Studies											R/M-39		
Book: Long Island Coastal Processes									R/M-44				
Erosion-Deposition Balance			R/M-2										
GL Lake Level Regulation						R/M-25							
Mass Wasting Lake Ontario Bluffs										R/M-35			
Dynamics of Nearshore Ice											R/M-38		
Evaluation of Dunkirk FTB						R/M-28							
FTB Design Criteria							R/P-17						
FTBs in Severe Wave Climates									R/P-25				
Marine Contractor's Handbook							R/M-31						
Structure Repair by Mineral Accretion										R/P-26			



	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	2	4	6	5	4	3	7	5	4	6	8	4	4
Percentage of pledged match	-	4	6	6	4	7	6	8	10	9	10	4	5
Percentage of total projects in year	4	6	6	6	6	12	11	6	11	10	15	7	6
Number of participating faculty	1	3	6	3	3	5	7	4	9	8	9	3	4
Disciplines of participating faculty	GEOL	GEOL GO	GEOL CENG LAW	GEOL BIOL CENG	GEOL BIOL CENG	GEOL CENG ENVENG BIOL	GEOL CENG ENVENG BIOL	CENG ENVENG	CENG ENVENG BIOL GEOL GO	MSENG EENG GEOL ENVENG CENG BIOL	GEOL ENVENG MSENG CENG GO	ENVENG CENG MSENG	GEOL ENVENG CENG
Research Publications - Articles	-	-	-	1	-	2	5	3	5	2	3	7	5
Reports	-	-	-	-	-	1	1	4	2	3	1	1	1
Popular	-	-	-	-	1	-	-	-	-	-	-	-	-
Other	-	1	-	-	-	-	-	-	-	-	4	1	-
Extension Effort-FTE - Marine	-	0.9	0.7	1.2	1.1	1.7	0.9	1.1	1.1	1.0	0.8	0.7	0.7
Great Lakes	-	-	-	-	0.2	0.5	0.9	1.0	1.3	1.5	1.4	1.1	0.8
Extension Outreach - Publications	-	-	-	1	-	1	2	2	1	1	-	1	-
Information Pieces	-	-	2	1	1	1	-	-	-	1	-	1	-
Audio-Visual	1	-	-	-	-	-	-	1	-	-	1	1	1
Newsletter	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Participating Students	-	1	7	11	9	11	15	11	7	8	7	10	7
Theses Produced	-	-	1	2	5	2	5	2	2	4	1	2	-

## Research: Shore Structures

### Program Element: Shore Structures and Processes

**What:** Basic and applied research on shore processes and coastal structures in support of a strong Extension commitment in this field. **Why:** New York's coastal areas are unusually erosion prone and, because they are substantially developed, erosion is a major coastal issue. New York Sea Grant has had effective coastal processes extension programs which required research back-up. In addition, New York Sea Grant engineers have contributed to basic understandings of processes and structures in the coastal environment. **Outcome:** Understandings necessary for extension programming have been developed. Basic research has made noteworthy contributions to the field.

Although Nassau and Suffolk Counties, Long Island, have only 0.6% of the nation's shoreline, they have over 10% of its critical erosion areas. Lake Ontario and the St. Lawrence regions also have severe erosion problems occasioned by vulnerable glacial tills which form bluffs along most of the coast. Some bluff areas are receding at rates in excess of 5 feet per year. Lake Erie's shores are composed of till bluffs situated on shale. Groundwater migration along the shale/till interface exacerbates slumping. Unlike some of the nation's coastal areas, New York's are already developed. Erosion threatens existing structures rather than potential developable sites. For these reasons New York Sea Grant gave priority to Extension programming in shore processes on both its Long Island and Great Lakes coasts. With Extension programs came a need for research back-up.

Former Extension Specialist Brian Doyle developed the concept of a three-pronged attack on New York's Great Lakes shore erosion problems: 1. develop information about the Lake Ontario bluffs; 2. study mass-wasting of bluffs, particularly where groundwater was involved; 3. consider the role of nearshore ice in coastal erosion and coastal structure damage. Needed was information on the New York situation so that practices and technical solutions developed elsewhere could be evaluated, and where appropriate, utilized. In 1973 a five year program of research on the Lake Ontario, and to a limited extent, Lake Erie, bluffs commenced. This research was completed with a series of technical reports based on student dissertations providing much of the needed information. A second research program, dealing with mass-wasting, was commenced in 1981, but was complicated by the move of the principal investigator to another institution. Nearshore ice dynamics research was started in 1982 and is being completed this year.

Extension Specialist Peter Sanko's successful program on Long Island's coastal area was not backed by a research program, but rather depended on his excellent collegial relationships with university faculty. Small research projects dealing with northshore bluff erosion and spoil stabilization have been sponsored. An innovative project has utilized high school science classes as a method for obtaining extensive data on beach profiles, an approach gaining increased use in other coastal areas as a means of gathering such data. New York Sea Grant has also sponsored a book in the series initiated by the Coastal Zone Management Program and being edited by Orin Pilkey and his associates.

An extremely popular book The Politics of Coastal Erosion by Joseph Heikoff (see Program Element: Coastal Zone Studies) has affected public policy towards use of hard structures in controlling erosion. Heikoff's study documented the political difficulties attending construction of the Westhampton Beach groin

field. The book's blue cover is still seen at public hearings on coastal erosion matters.

Extension Specialist Sanko's work with coastal contractors did, however, lead to the development of a series of works intended as handbooks for contractors. The marine contractors advisory committee expressed the need for reference documents other than those produced by the US Army Corps of Engineers or the various construction materials associations. Recognizing that most contractors had a high school education, the reference works would have to be of a nature useful to them. A series of handbooks were produced by students at Cornell's Environmental Engineering Department working under the direction of Professor Fred Kulhway. Many of these handbooks required new information, data generated by computer analysis, or compilations from existing literature. The completed handbooks have been made available as technical reports, and have received wide distribution. Negotiations are in progress with a commercial publisher for a final version.

New York Sea Grant bows to its sister program, Rhode Island Sea Grant, as the innovator of the floating tire breakwater. New York Sea Grant, will claim credit for having brought study of that device to a useful conclusion. Following the introduction of the concept, New York Sea Grant Extension Specialists were soon involved in the installation of a number of FTBs in the Great Lakes region where they have proved very popular. It was very quickly apparent that substantial new engineering data were required for adequate construction, mooring and safety information. Professor Volker Harms, a SUNY at Buffalo engineer undertook a number of studies from 1978 through 1980 producing a series of technical reports which have laid a firm groundwork for this technology. Extension Specialist DeYoung had prepared a highly successful booklet on the design, construction and emplacement of FTBs--it has been translated into several languages. Upon completion of the engineering studies, DeYoung, Harms and other "experts" prepared a revision of the FTB booklet. One additional study warrants mention. The performance of FTBs under severe wave conditions have been investigated by researchers from the Behrend Campus of The Pennsylvania State University under New York Sea Grant support. This project has usefully brought Pennsylvania researchers into Sea Grant, involved industry in the design and subsequent production of instrumentation, and provided data on FTB performance not previously available.

At the suggestion of Dr. Richard Kolf, National Sea Grant Office, Stony Brook engineers re-evaluated the technology developed at Texas some years ago for the construction of underwater structures through mineral accretion (electrocathodic deposition). Those investigations had not been adequately documented, and papers had been published in the unrefereed literature. The re-evaluation is now complete and it is apparent that not all claims put forward for mineral accretion can be substantiated and that the technology is apparently useful only in warmer waters. These results are being published in the refereed literature.

Over the past eight years New York Sea Grant has supported the theoretical investigations of Dr. Phillip P.K. Liu, Cornell University. Dr. Liu has made fundamental contributions to understandings of sediment transport through his mathematical modelling. He is currently involved in development of a new technique for describing wave refraction and diffraction. These basic contributions to the science of shoreline processes compliment the more applied research undertaken.

## Research: Shore Structures

Table R59. Project Titles

R/C-8	Coastal Inventory of the Great Peconic, Little Peconic, and Gardiner's Bay Shorelines of Long Island	Ali
R/M-2	Erosion-Deposition Balance, Great Lakes Shoreline, New York	Connally/ Calkin/ Apmann
R/M-14	Stabilization of Subtidal Sediments by Transplantation of Submerged Vegetation	Churchill
R/M-24	The Impact of Eelgrass on Heavy Metal Mobilization	Brinkhuis
R/M-25	Operating Rules for Regulation of Great Lakes Water Levels	Meredith
R/M-26	Coastal Currents and Sediment Transport on Great Lakes Shoreline	Liu
R/M-28	Evaluation of the Effects of Dunkirk Harbor Scrap Tire Floating Breakwater	Fahnestock
R/M-31	Development of a Coastal Structures Construction Manual	Kulhawy/ Sangrey
R/M-33	Episodic Bluff Erosion on the North Shore of Long Island	Bokuniewicz
R/M-34	Wave Refraction and Diffraction	Liu
R/M-35	An Evaluation of the Relative Importance of Mass Wasting Processes as a Mechanism of Lake Ontario Bluff Recession	Ray
R/M-38	Dynamics of Nearshore Ice	Rumer/ Calkin/ Shaw
R/M-39	Technical Control of Local Beach Studies	Bokuniewicz
R/M-44	Preparation of Book: Coastal Processes and Erosion Problems, South Shore, Long Island, New York	McCormick/ Pilkey
R/P-17	Development of Design Criteria for Floating Tire Breakwater	Harms
R/P-25	Engineering Studies on the Use of Floating Tire Breakwaters in Severe Wave Climates	Pierce/ Knuth/ Lewis
R/P-26	The Construction and Repair of Seawater Structures Through Mineral Accretion	Herman

R/U-2      Environmental Geomorphic Study of the Coastal  
             Regimes along the South Shore of Long Island

Coates

Table R60. Journal Articles

Bokuniewicz, H.

Monitoring Seasonal Beach Responses: An Educational and Public Service Program.

Journal of Geological Education, Vol. 29, 1981.

8100

Bokuniewicz, H.; Tanski, J.

Managing Localized Erosion of Coastal Bluffs.

Proceedings from Conference Coastal Zone '80, ASCE, Hollywood, Florida, 1980.

8000

Bokuniewicz, H.

The Seasonal Beach at East Hampton, New York.

NYSGI.

8000

Brinkhuis, B.; Penello, W.; Churchill, A.

Cadmium and Manganese Flux in Eelgrass ZOSTERA MARINA II. Metal Uptake by Leaf and Root-Rhizome Tissues.

Marine Biology, Vol. 58, 1980.

8000

Churchill, A.; Riner, M.

Anthesis and Seed Production in ZOSTERA MARINA L. from Great South Bay, New York.

Aquatic Botany, Vol. 4, 1978.

7800

Dalrymple, R.; Liu, P.

Waves Over Soft Muds.

Journal of Physical Oceanography, Vol. 8, No. 6, 1978.

7800

Faraday, W.; Churchill, A.

Uptake of Cadmium by the Eelgrass ZOSTERA MARINA.

Journal of Marine Biology, Vol. 53, No. 3, 1979.

7900

Harms, V.

Design Criteria for Floating Tire Breakwaters.

Journal of the Waterway, Port, Coastal and Ocean Division, Vol. 105, ASCE, 1979.

7900



**Research: Shore Structures**

Kim, S.; Liu, P.; Liggett, J.  
Boundary Integral Equation Solutions for Solitary Wave Generation, Propagation  
and Run-up.  
Coastal Engineering, Vol. 7, 1983.  
8300

Korlipara R.; Zatorski R.; Herman H.  
The Properties of Electrodeposited Minerals in Seawater.  
Marine Technology Society Journal, Vol. 17, No. 4, 1984.  
8400

Li, C.; Kiser, K.; Rumer, R.  
Physical Model Study of Circulation Patterns in Lake Ontario.  
Limnology and Oceanography, Vol.20, No.3, 1975.  
7500

Liu, P.; Tsay, T.  
Refraction-diffraction Model for Weakly Nonlinear Water Waves.  
Journal of Fluid Mechanics, Vol.141, 1984.  
8400

Liu, P.  
Mass Transport in the Free-Surface Boundary Layers.  
Coastal Engineering, Vol. 1, 1977.  
7700

Liu, P.  
Wave-Current Interactions on a Slowly Varying Topograph.  
Journal of Geophysical Research, Vol.88, No.C7, 20 May 1983.  
8300

Liu, P.; Lennon, G.  
Finite Element Modeling of Nearshore Currents.  
Journal of the Waterway, Port, Coastal and Ocean Division, ASCE,  
Vol.104, No.WW2, May 1978.  
7800

Liu, P.; Dalrymple, R.  
Bottom Frictional Stresses and Longshore Currents Due to Waves with Large  
Angles of Incidence.  
Journal of Marine Research, Vol. 36, No. 2, May 1978.  
7800

Liu, P.; Abbaspour, M.  
An Integral Equation Method for the Diffraction of Oblique Waves by an  
Infinite Cylinder.  
International Journal for Numerical Methods in Engineering, Vol. 18, 1982.  
8200

Liu, P.  
Combined Refraction and Diffraction: Comparison Between Theory and  
Experiments.  
Journal of Geophysical Research, Vol.87, No.C8, 20 July 1982.  
8200

Liu, P.; Tsay, T.  
On Weak Reflection of Water Waves.  
Journal of Fluid Mechanics, Vol. 131, 1983.  
8300

Liu, P.  
Permeable Wall Effects on Poissuille Flow.  
Journal of the Engineering Mechanics Division, Proceedings of the American  
Society of Civil Engineers, Vol.105, No.EM3, June 1979.  
7900

Liu, P.; Dalrymple, R.  
The Damping of Gravity Water-Waves Due to Percolation.  
Coastal Engineering, Vol. 8, 1984.  
8400

Liu, P.  
Diffraction of Solitary Waves.  
Journal of Waterway, Port, Coastal and Ocean Engineering, Vol. 110, No. 2,  
May 1984.  
8400

Lozano, C.; Liu, P.  
Refraction-Diffraction Model for Linear Surface Water Waves.  
Journal of Fluid Mechanics, Vol.101, 1980.  
8000

Mei, C.; Liu, P.  
Effects of Topography on the Circulation In and Near Surf Zone-- Linear  
Theory.  
Estuarine and Coastal Marine Science, Vol.5, 1977.  
7700

Penello, W.; Brinkhuis, B.  
Cadmium and Manganese Flux in Eelgrass ZOSTERA MARIN I.  
Modelling Dynamics of Metal Release from Labelled Tissues.  
Marine Biology, Vol. 58, 1980.  
8000

Pierce, R.  
Fabrication, Installation and Field Test Procedures for a Pipe-Tire Floating  
Breakwater.  
Proceedings of the Oceans '83 Conference.  
8300

Pierce, R.; Baker, M.  
Wave Dynamics and Surface Weather Measurements Utilizing Wireless Data  
Transmission Between Distributed Microprocessors.  
Proceedings of the Oceans '83 Conference.  
8300

## **Research: Shore Structures**

**Pierce, R.; Baker, M.**

**Microprocessor-Based Real-Time Measurement of Wave Direction and Dynamics.**  
IEEE Digest 1981, International Geoscience and Remote Sensing Symposium,  
Vols.1 and 2, Washington D.C., 8 June 1981.  
8100

**Rumer, R.**

**Simulation of Lake Ice Dynamics.**

**Proceedings of the Conference on Frontiers in Hydraulic Engineering,**  
Cambridge, MA., 9 August 1983.

8300

**Tsay, T-K; Liu, P.**

**A Finite Element Model for Wave Refraction and Diffraction.**

**Applied Ocean Research, Vol.5, No.1, 1983.**

8300

**Tsay, T-K.; Liu, P.**

**Numerical Solution of Water-Wave Refraction and Diffraction Problems in the**  
**Parabolic Approximation.**

**Journal of Geophysical Research, Vol. 87, No. C10, September 1982.**

8200

**Wu, C.; Liu, P.**

**Effects of Nonlinear Inertial Forces on Nearshore Currents.**

**Coastal Engineering, Vol. 8, 1984.**

8400

Table R61. Sea Grant Scholars/Theses

Current

Wendy Brown  
TIDAL HYDRAULICS OF STONY BROOK HARBOR: PREDICTIONS FROM A NUMERICAL MODEL  
James Holzmacher  
WAVE REFRACTION AND DIFFRACTION  
Pat Hyzy  
HEAT EXCHANGE AT AIR-ICE (AND ICE-WATER) INTERFACE DURING ICE MELT SEASON  
David Marcus  
FIELD STUDY OF ICE FORMATION AT STURGEON POINT, LAKE ERIE, AND EFFECT ON  
SHORE PROCESSES  
\*Ying Keung Poon  
ICE TRANSPORT BY WIND, WAVES, AND CURRENTS  
\*Sung Yoon  
WAVE REFRACTION AND DIFFRACTION

Graduated. Thesis Submitted

\*Madjid Abbaspour  
APPLICATION OF BOUNDARY INTEGRAL EQUATION METHOD TO WATER WAVE PROBLEMS  
8008  
Sandra Brennan  
ANALYSIS OF BLUFF EROSION ALONG THE SOUTHERN COASTLINE OF LAKE ONTARIO, NEW  
YORK  
7705  
William Brownlie  
COASTLINE CHANGES ON LAKE ONTARIO:THE EFFECT OF THE FEDERAL NAVIGATION  
PROJECT AT GREAT SODUS BAY  
7605  
William Burgess  
DOCKS;PIERS;AND WHARVES:A DESIGN GUIDE (COASTAL STRUCTURES HANDBOOK SERIES)  
8105  
Herbert Buxton  
THE CONTRIBUTION OF WESTERN NEW YORK STREAMS TO THE LAKE ERIE SEDIMENT BUDGET  
7605  
Francis Cheung  
ANALYSIS, DESIGN AND CONSTRUCTION OF PILE FORMATIONS IN THE COASTAL  
ENVIRONMENT (COASTAL STRUCTURES HANDBOOK SERIES)  
8105  
Mary Colburn  
COASTAL PROCESS AND CHANGE;LAKE ERIE;NEAR DUNKIRK NEW YORK  
7805  
Paul Costa  
ON THE NATURE OF SHOAL DISTRIBUTION IN THE GREAT SOUTH BAY  
7605  
Peter Crawford  
A THEORETICAL AND EXPERIMENTAL INVESTIGATION OF ICE TRANSPORT BY WATER WAVES  
8308

**Research: Shore Structures**

**\*Joseph DiLorenzo**

**THE EFFECTS OF INLET CONFIGURATION ON SALINITY AND TIDAL ELEVATION IN MORICHES BAY**  
**8309**

**Thomas Drexhage**

**MEASUREMENT AND ANALYSIS OF HISTORIC BLUFF RECESSION ALONG THE LAKE ONTARIO COAST IN NEW YORK**  
**7805**

**Laurie Ehrlich**

**BREAKWATERS; JETTIES; AND GROINS (COASTAL STRUCTURES HANDBOOK SERIES)**  
**8105**

**Kim Fortune**

**SEDIMENTATION AT AN INLET AT WILSON HARBOR ON LAKE ONTARIO, NEW YORK**  
**7811**

**Jonathan Freese**

**GENERAL PLANNING CONSIDERATIONS FOR SMALL-SCALE COASTAL STRUCTURES (COASTAL STRUCTURES HANDBOOK SERIES)**  
**8212**

**Richard Geier**

**GLACIAL STRATIGRAPHY AND BLUFF RECESSION ALONG THE LAKE ERIE COAST IN NEW YORK STATE**  
**7805**

**Stephen Gilje**

**AN EVALUATION OF THE EFFECTS OF SELECTED GROINS ON THE SOUTH SHORE OF LONG ISLAND, NEW YORK**  
**7405**

**Walter Hubbell**

**COASTAL CONSTRUCTION MATERIALS (COASTAL STRUCTURES HANDBOOK SERIES)**  
**7905**

**Robert Lamounette**

**A STUDY OF THE GERMINATION AND VIABILITY OF ZOSTERA MARINA SEEDS**  
**7605**

**Thomas Ostrye**

**AN APPROACH TO DEFINING GEOMETRICAL BEACH SHAPE CHANGES AT LOTUS BAY, NEW YORK ON LAKE ERIE**  
**7505**

**Michael Riner**

**A STUDY ON METHODS, TECHNIQUES AND GROWTH CHARACTERISTICS FOR TRANSPLANTED PORTIONS OF EELGRASS (ZOSTERA MARINA)**  
**7505**

**David Rollins**

**SHORELINE AND RIVER PROCESSES AT THE SITE OF PROPOSED SALMON RIVER BREAKWATER**  
**7905**

**Susan Ronan**

**REGULATORY PROCESSES IN COASTAL STRUCTURES CONSTRUCTION (COASTAL STRUCTURES HANDBOOK SERIES)**  
**8008**

**Thomas Turco**

**PREDICTING BEACH PLAN FORMS IN THE LEE OF AN OFFSHORE BREAKWATER**  
**7805**

**Christopher Visco**

**GEOMORPHIC EFFECTS ON OFF ROAD VEHICLES ON THE BEACH, FIRE ISLAND, NEW YORK**  
**7705**



Gary Weir

INLET FORMATION AND WASHOVER PROCESSES AT NORTH POND, EASTERN LAKE ONTARIO  
7605

Johannes Westerink

REDUCTION AND ANALYSIS OF FLOATING TIRE BREAKWATER DATA PERFORMED AT CERC IN  
1979 AND 1980  
8105

Status Uncertain

Thomas Bender 7907

Shih-Huang Chieh 7905

\*Hector Dejesus 7505

\*Sung Kim 8305

\*Ravi Korlipara 8305

Douglas Malik 7805

Thomas Saczynski 7905

Sharon Sneed 8405

Joseph Tanski 8105

\*Ting-Kuei Tsay 8206

Wai Yiu 7905

Did Not Graduate

Fred Bogolionge 7805

Thomas Fralick 8306

\*Anthony Richards 7605

John Stephens 7505

\*Doctoral Candidate

**Research: Shore Structures**

**Table R62. Sea Grant Scholars/First Occupation**

Thomas Bender  
7907

Fred Boglione  
7805  
Engineering firm, Buffalo

Sandra Brennan  
7705  
Geologist, NYDEC, Avon

William Brownlie  
7605  
PhD candidate, Cal. tech.

Wendy Brown  
8412

William Burgess  
8105

Herbert Buxton  
7605  
Geologist, USGS

Francis Cheung  
8105  
Engineering firm, FL

Shih-Huang Chieh  
7905

Mary Colburn  
7712  
Envir. consulting firm, Buffalo

Paul Costa  
7605  
Secondary School Teacher,  
Rhode Island

Peter Crawford  
8308  
Staff of CERC

Hector Dejesus  
7505  
PhD candidate, SUNY @ Buffalo, Eng.

Joseph DiLorenzo  
8309  
PhD candidate, MSRC

Thomas Drexhage  
7805  
Engineering Consultant, Buffalo

Laurie Ehrlich  
8105

Kim Fortune  
7811  
Geologist, Amax, Inc., Denver

Thomas Fralick  
8306  
Envir. Engineering firm, Buffalo

Jonathan Freese  
8212

Richard Geier  
7805  
Geologist, Chevron Oil, Louisiana

Stephen Gilje  
7405  
Geologist, Federal Highway Admin.,  
Washington, DC

James Holzmacher  
8412

Walter Hubbell  
7905  
Engineering firm, Oregon

Pat Hyzy  
8408

Ravi Korlipara  
8305  
PhD student, Mechanical Engineering,  
SUNY at Stony Brook

Sung Kim  
8305

Research: Shore Structures

Robert Lamounette  
7605  
Technican, Biology Dept., Stony Brook

Ting-Kuei Tsay  
8206  
Faculty position, Syracuse University

Douglas Malik  
7805

Thomas Turco  
7808  
Engineer, Tetra Tech, Inc., FL

David Marcus  
8408

Christopher Visco  
7705  
Teacher, Long Island

Thomas Ostrye  
7505  
Geologist, Marathon Oil, Texas

Gary Weir  
7605  
Geologist, Exxon Corp., Colorado

Ying Keung Poon  
8408

Johannes Westerink  
8105  
Doctoral candidate, Engineering, MIT

Anthony Richards  
7605

Wai Yiu  
7905

Michael Riner  
7505  
Biologist, Texas Instruments'  
Ecological Svcs Division on Hudson  
River

Sung Yoon  
8412

David Rollins  
7905  
Geologist, Exxon Production Research

Susan Ronan  
8008

Thomas Saczynski  
7905  
Engineering firm, Oswego, NY

Sharon Sneed  
8405  
MS candidate, MSRC

John Stephens  
7505

Joseph Tanski  
8105  
Extension Specialist, NY Sea Grant  
Extension Program

Research: Spoil Disposal

Table R63. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Dredge Spoil Disposal - LI Sound					R/M-22	-----C							
Contaminant Effects, LI Sound Spoils							R/M-29						
Containment of Spoils in Mined Pits									R/S-16	-----C			
Plan for Containment of Dredge Spoils										R/S-17	-----C		

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	-	-	-	-	2	2	1	-	15	1	10	5	-
Percentage of pledged match	-	-	-	-	1	2	1	-	0	1	-	0	-
Percentage of total projects in year	-	-	-	-	3	2	2	-	1	4	5	2	-
Number of participating faculty	-	-	-	-	1	1	1	-	1	3	3	2	-*
Disciplines of participating faculty	-	-	-	-	PO	PO	PO	-	GO	PO GO GEOL	GO PO	GO PO BIOL	*
Research Publications - Articles	-	-	-	-	-	1	1	1	-	-	3	-	-
Reports	-	-	-	-	1	1	-	2	-	-	-	-	-
Popular	-	-	-	-	-	-	-	-	-	-	1	-	-
Other	-	-	-	-	-	-	3	4	-	8	7	2	-
Extension Effort-FTE - Marine	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	-	-	-	-	-	-	-	-	-	-	-	-	-
Extension Outreach - Publications	-	-	-	-	-	-	-	-	-	-	-	-	-
Information Pieces	-	-	-	-	-	-	-	-	-	-	-	-	-
Audio-Visual	-	-	-	-	-	-	-	-	-	-	-	-	-
Newsletter	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Participating Students	-	-	-	-	-	1	1	1	2	2	4	3	-
Theses Produced	-	-	-	-	-	-	-	1	-	-	-	-	-

\*Funding currently pending

## Research: Spoil Disposal

### Program Element: Spoil Disposal

**What:** The concept of disposing of contaminated dredge spoils in holes created by sand mining operations has been explored. **Why:** Disposal of contaminated spoils from harbor maintenance projects is increasingly difficult. Sand mining, for fill or for construction aggregate creates depressions in the floor of the water body which may have environmental effects. Contaminated dredge spoils might safely be dumped into such depressions, restoring bottom configuration to the pre-mining state. This disposal option may be highly useful in areas of active mining and could, through cost offsets, provide a very attractive economic incentive for offshore mining. **Outcome:** A demonstration scale project is being carried out in the Lower Bay of New York Harbor. This experiment is largely funded by the US Army Corps of Engineers by pass-thru the Office of Sea Grant. Sea Grant Institutional funds have been used to provide program continuity. The NYS Office of General Services is incorporating the concept of "underwater landfills" for the disposal of contaminated spoils in its Underwater Mining Management Program currently being developed.

Estuarine harbors are settlement basins for sediments and catchment areas for anthropogenic contaminants. Harbor sediments are often contaminated, although only about 20% of the total volume severely so. Disposal of contaminated spoils is a severe national problem. Absence of effective alternatives to ocean dumping of contaminated spoils has led to constraints in the use of many east coast harbors.

Early research on spoil disposal sought to develop a management plan for dredge spoil disposal in Long Island Sound. Long Island Sound harbors, particularly those on the Connecticut shore, have been badly silted. Public opposition, strongest on the Long Island shore, has been vehemently opposed to dumping of harbor maintenance dredge spoils in Long Island Sound. Ocean disposal is effectively eliminated, as an alternative, because of costs of transport. A management plan exploring alternatives seemed a worthwhile endeavor for Sea Grant. However, local opposition, including that of Congressional representatives, to even pursuing the research, was such that while some of the research was undertaken, a plan was not developed.

A new direction for spoil disposal research was identified by J.R. Schubel at a New York District Corps of Engineers sponsored meeting exploring spoil disposal alternatives--the coupling of sand mining with dredged material disposal through the use of old borrow pits as repositories for contaminated spoils. The Corps was then beginning a study of dredged material disposal options in the New York District and were eager to see if this coupling could be made. The concept was included as one of five alternatives for spoil disposal in the New York District.

In October, 1978 recommendations for a research into the subaqueous borrow pit disposal of dredged material were discussed by Sea Grant, NYS Department of Environmental Conservation, NYS Office of General Services, the Environmental Protection Agency, NOAA's MESA Project, National Marine Fisheries Service, the Port Authority of New York and New Jersey, the Corps of Engineers and the Marine Sciences Research Center, SUNY at Stony Brook. A proposed demonstration project to determine the technical feasibility of the "backfill option" was outlined. Initial funding was provided by the NYS Office of General Services through its contract with the Sea Grant Institute.



## Research: Spoil Disposal

A Water Quality Permit from the NYS Department of Environmental Conservation (DEC) was required, as well as a Corps Permit. The DEC was wary of issuing a permit for a technical feasibility demonstration project which could be a precursor to expanded mining coupled with spoil disposal operations. These concerns, coupled with the the uncompleted biological impact studies of mining operations (See Program Element: Aggregate Mining), led to delays in issuance of permits for the experiment.

During summer of 1980 an experimental backfill disposal operation was conducted by the Marine Sciences Research Center in the Lower Bay. The success of this trial led the Corps to support a much larger backfill demonstration as part of its evaluation of alternative disposal options for the Port of New York. That research is currently in progress.

## Research: Spoil Disposal

Table R64. Project Titles

R/M-22	Disposal of Dredged Spoil in Central Long Island Sound: A Management Plan	Schubel
R/M-29	Contaminants in the Dredge Spoils and Benthic Organisms of Long Island Sound, and the Disposal of Dredged Materials	Schubel
R/S-16	Containment of Dredged Sediment Under the Floor of the Lower Bay of New York Harbor	Bokuniewicz/ Schubel
R/S-17	Plan for the Containment of Dredged Sediments in Submarine Borrow Pits	Bokuniewicz

Table R65. Journal Articles

Bokuniewicz H.; Minsch K.

The Role of Agencies, Scientists, and the Public in Planning Dredged-Sediment Disposal.

Oceans, September 1982.

8200

Bokuniewicz, H.; Liu, J.

Stability of Layered Dredged Sediment Deposits at Subaqueous Sites.

IEEE Oceans, 82 Conference Record, Vol. 2, 1982.

8200

Bokuniewicz, H.

Burial of Dredged Sediment Beneath the Floor of New York Harbor.

Oceans, September 1982.

8200

Carter, H.; Schubel, R.; et al.

Thermally Induced Biological Effects Caused by Once-Through Cooling Systems: A Rationale for Evaluation.

Environmental Management, Vol. 3, No. 4, 1979.

7900

Schubel, J.; Hirschberg, D.

Estuarine Graveyards, Climatic Change, and the Importance of the Estuarine Environment.

Estuarine Interactions, 1978.

7800

Schubel, J.

Sediment and the Quality of the Estuarine Environment: Some Observations.

Fate of Pollutants in the Air and Water Environments,  
Part 1, Vol.8, 1977.

7700

**Research: Spoil Disposal**

**Table R66. Sea Grant Scholars/Theses**

**Current**

NONE

**Graduated. Thesis Submitted**

**Karen Chytalo**

**PCSs IN DREDGED MATERIAL AND BENTHIC ORGANISMS IN LONG ISLAND SOUND  
7905**

**Status Uncertain**

**Mindy Berger 8303**

**Joanne Bowsman 8210**

**Walter Fitzpatrick 8208**

**James Liu 8308**

**Katherine Minsch 8305**

Table R67. Sea Grant Scholars/First Occupation

Mindy Berger

8303

Technical Specialist, MSRC

Joanne Bowsman

8210

Lawrence Livermore Lab, Univ. of California

Karen Chytalo

7905

Contaminant Monitoring, NYDEC, Stony Brook

Walter Fitzpatrick

8208

Air Quality Inspector, NYC Dept. of Environmental Protection

James Liu

8308

PhD candidate, MSRC

Katherine Minsch

8305

Sea Grant Congressional Intern (1984)

Table R68. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Salmonid Stocking Economic Impact		R/F-2	R/M-5	-----	R/R-5								
Analysis Salmon River Inlet						R/M-27	-----C						
Movements of Salmonids								R/F-12	-----	R/F-20	-----C		
Lake Ontario Salmonid Diet Survey													R/F-34
Bottom Features and Fishing Potential									R/R-17	-----	C		
Non-Salmonid Sportfishing Demand									R/R-16				
Trophic Interactions of Ontario Fishes										R/F-19	-----		
Impact of Alewife Spawning Migration												R/F-20	-----
Spawning of the St. Lawrence Muskies										R/F-21	-----C		
St. Lawrence River Muskies Fishery												R/G-2	-----
Valuation Great Lakes Sportfisheries													R/G-5
Eastern Erie-W. Ontario Sportfishery				R/M-20	-----	C							
Marine Recreational Angling Survey								R/F-27	-----	C			
Recreational Fishing in NYC										R/F-26	-----C		



	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	-	1	1	2	1	1	-	2	2	3	4	4	4
Percentage of pledged match	-	1	1	1	1	1	-	3	4	5	6	2	5
Percentage of total projects in year	-	3	3	6	3	2	-	4	6	8	10	10	8
Number of participating faculty	-	1	2	2	1	1	-	4	5	6	7	8	5
Disciplines of participating faculty	-	REC	REC	REC BIOL	REC	CENG	-	BIOL ANTH GEOL CHEM	BIOL GEOL REC	GEOL BIOL ADM	GEOL BIOL	ECON BIOL GEOL ADM	ECON BIOL GEOL CHEM VET
Research Publications - Articles	-	-	-	-	-	2	2	3	-	-	-	3	-
Reports	-	-	-	-	1	-	-	-	-	-	-	-	-
Popular	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	1	-	-
Extension Effort-FTE - Marine	-	-	-	-	-	-	-	0.1	0.2	0.2	0.2	0.2	0.2
Great Lakes	-	-	0.2	1.3	0.9	0.7	0.6	0.3	0.5	0.6	0.7	1.1	0.8
Extension Outreach - Publications	-	-	-	-	-	-	5	-	2	-	1	1	2
Information Pieces	-	-	1	2	3	3	1	-	-	2	1	3	-
Audio-Visual	-	-	-	-	-	-	1	-	1	-	-	-	-
Newsletter	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Participating Students	-	-	-	1	3	3	-	1	5	6	4	7	5
Theses Produced	-	-	-	-	3	-	-	-	1	-	-	1	-

## Research: Sportfishery

### Program Element: Sportfishery

**What:** Research related to the sportfisheries of New York's Great Lakes and marine waters. **Why:** Sportfishing is a major user of the living resources of New York's coastal waters. For some marine finfish, more than four times the commercial catch is landed by sportfishermen. Lake Ontario has been, by state policy, dedicated to sportfishing. Lake Erie coastal development hopes are being hung on a successful sportfishery. **Outcome:** Sea Grant has developed a strong Extension and research program on Lake Ontario. Marine sportfishery development is commencing. Extension programming is strong--research resources are not and will require development to support the extension initiative. Specific outcomes are:

- o A strong sportfishing industry has been developed on Lake Ontario.
- o There has been success in broadening the Lake Ontario sportfishery beyond attention to salmonids.
- o A Sea Grant professorship in Lake Ontario sportfishery population dynamics is creating a focal point for the development of coordinated research activities on Lake Ontario.
- o Successful development of the Lake Ontario sportfishery is stimulating local interest along Lake Erie: The academic sector is responding by expanding its capabilities for research.
- o A unique Sea Grant educational program, the E/V Ontario, has been successfully carried out for two years almost entirely on private funds.
- o The Sportfishermen's Forum has been conducted for two years on Long Island attracting substantial local support from sportfishing organizations.

This program element is closely related to Recreation and Tourism and was once included in that category. But as fishery research expanded, it became desirable to separate activities dealing with the resource base from those primarily concerned with the development of the social and commercial infrastructure. The major portion of sportfishery research has been done on the Great Lakes, predominantly Lake Ontario. Control of the lamprey, restocking of salmonids, positive effects of pollution abatement all contributed to a booming sportfishery in Lake Ontario--an industry which is the mainstay of tourism along that coast.

Early research documented the developing salmonid fishery and its economic impact on the Lake Ontario coastal communities. That basic data has been invaluable for Extension work with communities in helping them to understand what they would have to do to meet the demands of sportfishermen. At first the salmonid fishery was shore-based and concentrated in that short period of time when the salmon made their spawning runs. The fish were too few in number for a successful offshore fishery. But as stocking increased, the opportunities for an offshore fishery grew. Extension Specialist Michael Voiland sought research help in locating the salmon when in the lake. Professor Jimmy Haynes, using radio-tracking techniques, documented their location--information Voiland used in building the present charter fleet. (When Voiland and James Murray (now Extension Leader, North Carolina Sea Grant) were graduate students, their Sea Grant research showed a potential for Lake Ontario charter operations: At least one of them contributed significantly to its development.)

An initiative of Extension Specialist Voiland, presented as an alternative to the Institute's proposal for a land-based facility as a focal point for sportfishery research and education, was to create the Educational Vessel

Ontario. Commenced at the time of greatest uncertainty for Sea Grant continuity, the E/V Ontario project was, with exception of Voiland's salary, a summer student stipend and sundry contributions from the College of Agriculture and Life Sciences, funded by private in-kind and cash donations. A popular sportfishing vessel, state-of-the-art fishing gear and all other appurtenances have been contributed for a floating sportfishing educational activity.

In 1980 the Sea Grant Institute announced a competition for a Sea Grant Professorship in Lake Ontario Sportfishery Population Dynamics. Five campuses responded with proposals. The award was made to the joint proposal by the SUNY College of Environmental Science and Forestry and SUNY College at Oswego. In 1982 those campuses selected Dr. Stephen Brandt for the professorship. Brandt has had a significant impact on Lower Great Lakes fishery research. He has organized a monthly researchj discussion meeting of interested biologists both from academic institutions and federal and state laboratories. This now has an attendance of about 20, and is resulting in coordinated research efforts on the fishery.

Success of Extension and research activities in stimulating the development of the sportfishery of Lake Ontario has resulted in strong demand from counties bordering Lake Erie for a comparable Sea Grant effort. Congressional interest, particularly by Representttive Nowak, Buffalo, has caused a reformulation of SUC at Buffalo's Great Lakes Laboratory to a broader mission including sportfishery research. That laboratory expects to appoint three new fishery biologists in 1985.

Sportfishery Extension programming is developing in the marine district. Research has been limited, and research interest is not great. A study of shore-based fishermen in New York City was undertaken, cooperatively with the MESA New York Bight Project, because of the absence of information about those fishermen. It was often stated that these fishermen were largely subsistence fishermen, an assertion used by City legislators to block a planned marine recreational fishing license. That study, by Heatwole and West of City University of New York and the University of Rhode Island, respectively, has been used by:

- o NYS Department of Environmental Conservation in planning its strategy for a marine recreational fishing license;
- o NYS Health Department in its decision not to pursue a linked epidemiological study of risk-induced from contaminants in the fish because...
- o MESA New York Bight Project data on contaminants in those species most frequently caught by shore-based fishermen showed low levels of most contaminants;
- o New Jersey Health Department in planning its study of New Jersey shore-based fishermen and their use of caught fish;
- o NYS Office of Parks and Recreation and NYC offices in the planning of new access sites on New York City's shore.

Sea Grant Extension Specialists have organized a Sportfishing Forum for the past two years. These successful events clearly indicate the organizational strength of the sportfishermen and their expectations of Sea Grant for an enhanced research program.

## Research: Sportfishery

Table R69. Project Titles

R/F-2	Impact of Coho Salmon upon New York Fishermen and Communities	Brown
R/F-12	Determining Movement Patterns of Salmonids to Aid Sport Fishing and Stock Assessment	Winter
R/F-19	Population Dynamics of Lake Ontario Fishes	Squires
R/F-20	Impact of Alewife Spawning Migration of Young Warmwater Fish	Brandt/ Weber
R/F-21	Characterization of Spawning Sites, Spawning and Post-Spawning Behavior of the Great Lakes Muskellunge ( <u>Esox masquinongy</u> ) in the International Portion of the St. Lawrence River	Osterberg
R/F-26	Recreational Fishing in New York City	Heatwole/ West
R/F-27	Support for Marine Recreational Angler Study	Wilkins/ Dawson
R/F-34	Lake Ontario Salmonid Diet Survey	Brandt
R/G-2	Ecological Relationships of Esocids in the St. Lawrence River	Werner/ Ringler
R/G-5	The Value of Great Lakes Sport Fisheries	Kahn/ Menz
R/M-20	The Eastern Erie - Western Ontario Sport Fishery	Hadley
R/M-27	Hydraulic and Sedimentologic Analysis of Salmon River Inlet	Meredith
R/R-16	Assessment of Great Lakes Non-Salmonid Sport Fishing Demand	Brown
R/R-17	Lake Ontario Bottom Features and Sport Fishing Potential	Scrudato/ Gannon/ Engel

Table R70. Journal Articles

Brown, T.  
Economic Impact of New York's Great Lakes Sport Fisheries.  
J. Great Lakes Res., October, 1977.  
7700

Dunning, D.; Hadley, W.  
Participation of Nonlicensed Anglers in Recreational Fisheries, Erie County,  
NY.  
Transactions of the American Fisheries Society, Vol. 107, No. 5, 1978.  
7800

George, E.; Hadley, W.  
Food and Habitat Partitioning Between Rock Bass (AMBLLOTITES RUPESTRIS) and  
Smallmouth Bass (MICROPTE DOLOMIEUI) Young of the Year.  
Transactions of the American Fisheries Society, Vol. 108, May 1979.  
7900

George, E.; Harrison, E.; Hadley, W.  
The Incidence of MYXOBOLUS DENTIIUM (Protozoa Myxosporida) In Esox Masquinongy  
of the Upper Niagara River.  
Transactions of American Fishery Society, Vol. 106, No. 3, 1977.  
7700

Harrison, E.; Hadley, W.  
Biology of the Muskellunge (ESOX MASQUINONGY) in the Upper Niagara River.  
Transactions of the American Fisheries Society, Vol.108, 1979.  
7900

Harrison, E.; Hadley, W.  
A Comparison of the Use of Cleithra to the Use of Scales for Age and Growth  
Studies.  
Transactions of the American Fisheries Society, Vol.108, 1979.  
7900

Harrison, E.; Hadley, W.  
Ecologic Separation of Sympatric Muskellunge and Northern Pike.  
American Fisheries Society, Special Publication 11, 1978.  
7800

Haynes, J.  
Finding Salmon and Trout in Lake Ontario.  
Water Spectrum, Spring 1983.  
8300

Heatwole, C.; West, N.  
Urban-Based Fishing: A Health Hazard?  
Proceedings of the Third Symposium on Coastal and Ocean Management,  
San Diego, CA., 1 June 1983.  
8300

Menz, F.  
An Economic Evaluation of the St. Lawrence River- Eastern Lake Ontario Bass  
Fishery.  
Fishery Bulletin, Vol.81, No.1, 1983.  
8300

**Research: Sportfishery**

**Table R71. Sea Grant Scholars/Theses**

**Current**

Andrew Bader

EFFECTIVENESS OF AN ARTIFICIAL REEF IN ATTRACTING FISH AND BENTHIC  
MACROINVERTEBRATES IN LAKE ONTARIO

Vele Galovski

THE VALUE OF GREAT LAKES FISHERIES

Michael Kruse

ECOLOGICAL RELATIONSHIPS OF ESOCIDS IN THE ST. LAWRENCE RIVER

Steven LaPan

ECOLOGICAL RELATIONSHIPS OF YOUNG ESOCIDS DURING THEIR FIRST YEAR OF LIFE IN  
THE ST. LAWRENCE RIVER

David MacNeill

IMPACT OF ALEWIFE SPAWNING MIGRATION ON YOUNG WARMWATER FISHES

Doran Mason

IMPACT OF ALEWIFE SPAWNING MIGRATION ON YOUNG WARMWATER FISHES

**Graduated, Thesis Submitted**

\*Dennis Dunning

THE ATTITUDES AND CHARACTERISTICS OF ANGLERS AND NON-ANGLERS AS THEY RELATE  
TO SPORT FISHING IN ERIE COUNTY, NY

7705

\*Edward Harrison

COMPARATIVE ECOLOGIC LIFE HISTORIES OF SYMPATRIC POPULATIONS OF ESOX LUCIUS  
AND ESOX MASQUINONGY OF THE UPPER NIAGARA RIVER

7705

Gerald Mikol

INVESTIGATION OF POPULATION DYNAMICS OF RAINBOW TROUT OF THE UPPER NIAGARA  
RIVER

7705

David Nettles

ECOLOGY OF LAKE ONTARIO BROWN TROUT

8308

Mark Wenger

SPRING AND FALL MIGRATIONS OF SALMONIDS IN EASTERN LAKE ERIE DETERMINED BY  
RADIOTELEMETRY

8005

**Status Uncertain**

\*John Beatty 8312  
Robert Danehy 8209  
Jane Davies 8312  
Robert Olson 8311

**Did Not Graduate**

Jon Anderson 8105  
James Serio 8105  
James Sylver 8105

\*Doctoral Candidate



Table R72. Sea Grant Scholars/First Occupation

Jon Anderson  
8105

Andrew Bader  
8412

John Beatty  
8312  
PhD Student, Cornell

Robert Danehy  
8209

Jane Davies  
8312  
MS Candidate, Clarkson Univ.

Dennis Dunning  
7705  
Biologist, NYS Power Authority

Vele Galovski  
8408

Edward Harrison  
7705

Michael Kruse  
8412

Steven LaPan  
8412

David MacNeill  
8412

Doran Mason  
8412

Gerald Mikol  
7705  
Fisheries Biologist, NYSDEC

David Nettles  
8308  
Research Assistant, Cornell  
Cooperative Fishery Unit

Robert Olson  
8311  
Research Associate, Univ. Wisconsin,  
Madison

James Serio  
8105

James Sylver  
8105

Research: Water Quality

Table R/3. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Natural Cleaning of Sea Surface	R/Q-1												
Oil-Water Separation System for Tankers	R/Q-5												
Exchanges between LI Sound & East R.	R/Q-8												
Trace Metals and Organics in Mar Env	R/Q-10												
Effects of Pollutants on Phytoplankton					R/H-1	-----C							
Effects of PCB in Estuarine Environ.								R/Q-14				R/Q-21	
Resistance of Phytoplankton to Toxics													
Does the Surf Transfer Viruses					R/H-2	-----C						R/Q-23	-----
Flow-Balancing for Sewer Overflow												R/M-43	-----
Risk, Information & Develop Mar Res													R/M-50
Nitrogen Loads & Eutroph - Puerto Rico													
W.N.Y. Water Pollution Enforcement	R/U-3												
Effects Pollution Abatement L Ontario	R/U-4												
Effects of Cladophora in Great Lakes	R/Q-6												
Pollutant Distribution in Great Lakes	R/Q-9												
Determination of Trace Heavy Metals	R/Q-13												
Physical Model Study of Lake Ontario	R/U-6												
Mirex-Sediment Relationships								R/Q-15	-----C				
Prairie Voles as Mirex Test Animals								R/Q-16	-----C				
Partitioning of Mirex and Photomirex												R/Q-20	-----
PCB's and Viral Disease in Trout												R/Q-22	-----
Preparing the Public for Oil Spills								R/Q-18					

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	23	-	-	-	11	-	-	3	1	-	-	7	3
Percentage of pledged match	-	-	-	-	13	-	-	6	0	-	-	7	5
Percentage of total projects in year	38	-	-	-	6	-	-	8	4	-	-	13	8
Number of participating faculty	10	-	-	-	3	-	-	5	3	-	-	12	6
Disciplines of participating faculty	BIOL SOC CENG PHYS CHEM	-	-	-	CHEM BIOL	-	-	BIOL CHEM GEOL ANTH	BIOL CHEM GEOL	-	-	CHEM GEOL BIOL CENG ECON VET	CHEM GEOL BIOL ECON VET
Research Publications - Articles	1	-	-	1	2	2	3	2	2	-	5	1	-
Reports	2	-	-	-	-	-	-	-	-	-	-	-	-
Popular	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-
Extension Effort-FTE - Marine	0.2	0.4	0.3	0.5	0.4	0.7	1.0	1.1	0.8	0.6	0.6	0.6	0.6
Great Lakes	-	-	-	0.1	-	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Extension Outreach - Publications	-	-	-	-	-	-	-	-	1	-	-	-	-
Information Pieces	-	-	-	-	-	-	-	1	-	-	-	-	-
Audio-Visual	-	-	-	-	-	-	-	-	-	-	-	-	-
Newsletter	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Participating Students	-	-	-	-	-	-	-	2	2	1	-	7	7
Theses Produced	-	-	-	-	-	-	-	-	-	-	-	1	-

## Research: Water Quality

### Program Element: Water Quality

**What:** Water quality research, a major part of early Sea Grant programs, has more recently been focussed on unique New York opportunities to the understanding of pollution problems. **Why:** Sea Grant's advisors gave high priority to pollution-related research both because of its intrinsic importance and because coastal water pollution was a national issue at the time. Program focus on coastal development reduced pollution research in general priority. But specific research activities dealing with water quality and water pollution are undertaken. **Outcome:** Mirex and Mirex-related compounds research sponsored by Sea Grant has been utilized by various federal and state agencies in harbor dredging decisions and in design of clean-up of contaminated sediments in Lake Ontario estuaries. New concepts on the interaction between phytoplankton communities and chlorinated hydrocarbons in the marine environment have been developed.

It is not surprising, in retrospect, that New York Sea Grant's initial program should have as its primary emphasis Water Quality research. In the early 1970's an awareness of water pollution was still growing and on both New York's coasts, water quality was an issue. Both the Marine and Great Lakes Advisory Councils gave similar advice to the developing Sea Grant program: Without quality of water, all other uses of the coastal environment will be lessened. The scientific community was also geared up for this field of research and met the first call-for-Sea-Grant-proposals with a deluge of water quality related ideas. While ten of the first year projects were identified as water quality related, none survived into the second year program unmodified. The reason? Both National Sea Grant and New York program managers were aware of the enormous potential of 'pollution-related' research to absorb funds and were anxious to channel academic interests into more Sea Grant related endeavors. Research was, accordingly, directed towards more developmentally oriented projects. This continues to be the stance of the Sea Grant Institute: Pollution related research is not of a high priority unless it is in some way directly related to coastal development concerns.

But, some water quality research initiated in the first year of Sea Grant did survive into subsequent years:

- o Thermal pollution related research became the nucleus for the Program Element: Power Plant Siting on Lake Ontario.

- o Concerns over eutrophication induced Cladophora abundance led to the search for a mosquito larvicide derived from that plant (See Program Element: Aquaculture and Natural Products).

At the 1976 Sea Grant site visit, during a presentation on the developing salmonid sportfishery in Lake Ontario, Extension Specialists nervously awaited telephoned information of a Mirex-induced NYS Department of Health advisory against consumption of salmonid fish from Lake Ontario. Because of the health advisory, there was renewed pressure from agencies and academics for Sea Grant to join in microcontaminant research. In 1978, John Judd, then Executive Officer of the Institute, convened a workshop of interested parties, including several leaders of Upper Great Lakes microcontaminant studies, to define what, if any, contaminant research New York Sea Grant might encourage. The workshop concluded that Mirex contamination of Great Lakes waters was a uniquely New York problem, and our contribution should focus on it. This led to a group of four projects conducted from 1979 to 1984 dealing with Mirex and its derivatives (an apparent gap in the sequence was filled by a grant from NOAA's

Office of Marine Pollution Assessment).

Charles Wurster, SUNY at Stony Brook, had developed a research team of national significance in his investigations of interactions of PCB's and phytoplankton. While the majority of his research was supported by EPA, NOAA's various pollution oriented offices, and other agencies, Sea Grant funds have played an important role. From time to time, gaps would develop in Wurster's funding continuity. Sea Grant flexibility would be utilized to provide needed support to keep the research team together, and, not infrequently, to initiate new lines of research too speculative for other agencies.

Most recently, the Sea Grant Institute funded a project cooperatively with New York City's Environmental Protection Administration to test the effectiveness of a low-cost Swedish device to reduce the loading to the estuary of combined-sewer overflow. This promising project, with substantial industrial funding, participation by the Swedish government and New York City, has failed to fully live up to expectations because of delays in the funding of New York City's portion of the project. Nonetheless, collaboratively funded projects such as this have lasting beneficial effects on relationships between agencies and Sea Grant as well as contributing to improved water quality.

As a part of New York Sea Grant's continuing commitment to collaborative programs with Puerto Rico Sea Grant, the Institute in 1984 funded participation in a eutropication study by a SUNY at Stony Brook researcher. These kinds of interactions are very important to Puerto Rico's faculty for its brings new competencies to them and stimulates new ideas.

Extension programming in water quality is to be found in almost everything Extension does, for the admonition of the early Advisory Councils was sound: Quality of water is a requirement for most coastal activities. Specific Extension projects have been carried out in the New York Bight in collaboration with NOAA's MESA New York Bight Project. Initially MESA provided funds for an additional Sea Grant Extension Specialist who would carry out specific educational activities related to the Bight. This experiment was marginally successful, having as its greatest drawback the duality of responsibility felt by the Specialist: To MESA for content of program; To Sea Grant for program conduct. Later cooperative work with the MESA program involving preparation of specific educational materials by existing Extension Specialists and Communications staff were more successful.

New York Sea Grant's perceived mission of coastal development places stress on Extension programming on Lake Ontario. There, while assisting individuals, organizations and local governments in the development of sportfishery-based recreation and tourism, Sea Grant is also heeding the extent health advisory on consumption of many species of Lake Ontario fishes. Thus, while specialists assist, and participate in, fishing derbies, they are also distributing literature on the nature of the health advisory, on the reduction of contaminants in salmonids and related matters. NYS Commissioner of Health, David Axelrod, has called New York Sea Grant's efforts with respect to contaminantion of Lake Ontario fishes "the only significant effort with respect to the health advisory being carried out by any state organization."

## Research: Water Quality

Table R74. Project Titles

R/H-1	Effects of Persistent Pollutants on Plankton Communities	Wurster/ O'Connors
R/H-2	Does the Surf Transfer Viruses to the Atmosphere	Baylor/ Baylor
R/M-34	Risk, Information and the Development of Marine Resources	Conrad
R/M-50	Effects of Nitrogenous Loading through Cultural Eutrophication of the Mangrove/Seagrass Ecosystem at La Parguera, Puerto Rico	Capone
R/Q-1	Natural Processes that Clean the Sea Surface	Baylor
R/Q-5	Development of an Effective Oil-Water Separating System for Use on Board Ships	Femenia
R/Q-6	Environmental Effects of <u>Cladophora</u> in the Great Lakes	Judd
R/Q-8	Study of Exchange of Nutrients and Salinity Between East River and Long Island Sound	Longobardi
R/Q-9	Elemental Pollutant Distribution in Lake Erie and Lake Ontario Ecosystems	Pillay
R/Q-10	Interaction of Dissolved Macromolecules with Trace Metals in the Marine Environment	Schrier
R/Q-13	The Determination of Traces of Heavy Metals in Environment Samples and Their Removal from Lake Waters	Van Geet
R/Q-14	The Behavior and Biological Effects of PCB in Aquatic and Estuarine Environments	Wurster/ O'Connor
R/Q-15	Lake Ontario Bottom Sediment - Mirex Relationships	Scrudato/ DelPrete
R/Q-16	Reproduction and Tissue Response in Prairie Voles Fed Mirex and Lake Ontario Coho Salmon	Martin
R/Q-18	Preparing the Public for Hazardous Substance Spills	Omohundro
R/Q-20	Partitioning of Mirex and Photomirex in the Oswego River and Lake Ontario	Hassett/ Scrudato/ Weber
R/Q-21	Resistance to Toxic Chemical Pollutants by Marine Phytoplankton	Wurster/ Rowland



Research: Water Quality

R/Q-22	Interaction of Polychlorinated Biphenyls and 2,3,7,8 Tetrachlorodibenzo-p-dioxin with the Resistance of Rainbow Trout to Viral Diseases	Schat/ Spitzberger
R/Q-23	A Study of a Flow Balancing Method for Combined Sewer Overflow in Fresh Creek Basin, Jamaica Bay, New York	Cataldo/ Thatcher/ Ahmad
R/U-3	An Analysis of Water Pollution Enforcement in Western New York Region	Ford
R/U-4	Changes in a Portion of Lake Ontario Due to Pollution Abatement	Judd
R/U-6	Physical Model Study of Lake Ontario	Rumer

**Research: Water Quality**

**Table R75. Journal Articles**

Baylor, E.; Baylor, M.  
Surf-to-Wind Transfer of Viruses.  
Annals of the New York Academy of Sciences, Vol.353, 5 December 1980.  
8000

Baylor, E.; Baylor, M.; et al.  
Virus Transfer from Surf - To - Wind.  
Science, Vol.198, 11 November 1977.  
7700

Biggs, D.; Rowland, R.; et al.  
A Comparison of the Effects of Chlordane and PCB on the Growth,  
Photosynthesis and Cell Size of Estuarine Phytoplankton.  
Environmental Pollution, Vol.15, 1978.  
7800

Biggs, D.; Powers, C.; et al.  
Uptake of PCB's by Natural Phytoplankton Assemblages: Field and Lab  
Determination of <sup>14</sup>C-PCB Particle - Water Index of Sorption.  
Environmental Pollution (Series A) Vol. 22, 1980.  
8000

Biggs, D.; Rowland, R. ; Wurster, C.  
Effects of Trichloroethylene, Hexachlorobenzene and Polychlorinated  
Biphenals on the Growth and Cell Size Marine Phytoplankton.  
Bulletin of Environmental Contamination and Toxicology,  
Vol. 21, 1979.  
7900

Bocsor, J.; Judd, J.  
Effect of Paper Plant Pollution and Subsequent Abatement on a Littoral  
Macroinvertebrate Community in Lake Ontario:Preliminary Survey.  
Proceedings, 15th Conference Great Lakes Research, 1972.  
7200

Judd, J.; Sweeney, R.  
The Distribution and Role of Aquatic Macrophytes and Cladophora in the Great  
Lakes.  
International Joint Commission on Environmental Mapping of the Great Lakes,  
1976.  
7600

Judd, J.; Boscior, J.  
Environmental Changes in a Portion of Lake Ontario Following Pollution  
Abatement.  
Verh. Internat. Verein. Limnol., Vol. 19, 1975.  
7500

Magnani, B.; Powers, C.; et al.  
Effects of Chlordane and Heptachlor on the Marine Dinoflagellate, EXUVIELLA  
BALTICA, Lohmann.  
Bulletin of Environmental Contamination and Toxicology, Vol.20, 1979.  
7800

Michaels, R.; Rowland, R.; Wurster, C.  
Polychlorinated Biphenyls(PCB) Inhibit Photosynthesis Per Cell in the Marine  
Diatom Thalassiosira Pseudona.  
Environmental Pollution, Series A, 1982.  
8200

Nau-Ritter, G.; Wurster, C.; Rowland, R.  
Polychlorinated Biphenyls(PCB) Desorbed From Clay Particles Inhibit  
Photosynthesis by Natural Phytoplankton Communities.  
Environmental Pollution, Series A, 1982.  
8200

Nau-Ritter, G.; Wurster, C.; Rowland, R.  
Partitioning of (14C) PCB Between Water and Particulates with Various Organic  
Contents.  
Water Resources, Vol.16, 1982.  
8200

Nau-Ritter, G.; Wurster, C.  
Sorption of Polychlorinated Biphenyls(PCB) to Clay Particles and Effects of  
Desorption on Phytoplankton.  
Water Res. Vol. 17, No. 4, 1983.  
8300

O'Connors, H.; Wurster, C.; et al.  
Polychlorinated Biphenyls May Alter Marine Tropic Pathways by Reducing  
Phytoplankton Size and Production.  
Science, Vol.201, 25 August 1978.  
7800

Powers, C.; Wurster, C.; Rowland, R.  
DDE Inhibition of Marine Algal Cell Division and Photosynthesis per Cell.  
Pesticides, Biochemistry and Physiology, Vol.10, 1979.  
7900

Powers, C.; Rowland, R.; et al.  
Response to Polychlorinated Biphenyls of Marine Phytoplankton Isolates  
Cultured Under Natural Conditions.  
Journal of Applied and Environmental Microbiology, Vol.34, No.6, December  
1977.  
7700

Powers, C.; Rowland, R.; Wurster, C.  
Dialysis Membrane Chambers as a Device for Evaluating Impacts of Pollutants on  
Phytoplankton Under Natural Conditions.  
Journal of Water Research, Vol. 10, 1976.  
7600

## Research: Water Quality

Powers, C.; Nau-Ritter, G.; et al.  
Field & Laboratory Studies of the Toxicity to Phytoplankton of Poly-  
Chlorinated BiPhenyls(PCB) Desorbed from Fine Clays and Nat.Sus. Particles.  
Great Lakes Res., Vol.8, No.2, 1982.  
8200

Scrudato, R.; DelPrete, A.  
Lake Ontario Sediment-Mirex Relationships.  
Journal of Great Lakes Resources, 1982.  
8200

## Table R76. Sea Grant Scholars/Theses

### Current

\*Jose Castro  
BIOECONOMICS OF MULTISPECIES SYSTEMS  
Paul Fassinger  
RISK;INFORMATION;AND THE DEVELOPMENT OF MARINE RESOURCES  
\*Michael Melcer  
CHARACTERIZATION OF DISSOLVED ORGANIC MATTER IN THE OSWEGO RIVER AND LAKE  
ONTARIO  
Raymond Valente  
EFFECTS OF TRACE METALS ON DIATOM RESTING SPORE FORMATION  
\*Chengqing Yin  
PARTITIONING OF MIREX IN THE WATER COLUMN OF THE OSWEGO RIVER AND LAKE  
ONTARIO

### Graduated, Thesis Submitted

Brian Duncan  
THE DEVELOPMENT IN THE LABORATORY OF RESISTANCE TO PCB BY MARINE  
PHYTOPLANKTON  
8308

### Status Uncertain

Franz Martin 8105  
\*Julia Myers 8401  
Barry Snyder 8405

### Did Not Graduate

Teresa Dillon 8005

\*Doctoral Candidate

Table R77. Sea Grant Scholars/First Occupation

Jose Castro  
8408

Teresa Dillon  
8005

Brian Duncan  
8308  
MS Candidate, MSRC

Paul Fassinger  
8412

Franz Martin  
8105  
Senior Chemist, FMC Corp., Princeton, NJ

Michael Melcer  
8412

Julia Myers  
8401  
Masters candidate, Cornell Ag. Economics

Barry Snyder  
8405  
MS candidate, MSRC

Raymond Valente  
8408  
MS candidate, MSRC

Chengqing Yin  
8412

Research: Wetlands

Table R78. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Wetlands Redevelopment Demonstration		R/W-1											
History of Wetlands Management		R/W-2	R/C-4										
Eastern Ontario Wetlands Dynamics			R/M-6 -----C										
Use of East Ontario Wetlands by Pike			R/M-7 -----C										
Modification of GL Disposal Sites		R/W-3											



	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	-	3	5	2	-	-	-	-	-	-	-	-	-
Percentage of pledged match	-	4	5	2	-	-	-	-	-	-	-	-	-
Percentage of total projects in year	-	10	9	6	-	-	-	-	-	-	-	-	-
Number of participating faculty	-	4	3	2	-	-	-	-	-	-	-	-	-
Disciplines of participating faculty	-	BIOL CENG LAW	BIOL LAW F	BIOL F	-	-	-	-	-	-	-	-	-
Research Publications - Articles	-	-	1	-	-	-	-	-	-	-	-	-	-
Reports	-	1	-	1	-	1	-	-	-	-	-	-	-
Popular	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-
Extension Effort-FTE - Marine	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	-	-	0.1	0.1	0.1	-	-	-	-	-	-	-	-
Extension Outreach - Publications	-	-	-	-	-	-	-	-	-	-	-	-	-
Information Pieces	1	-	-	-	1	-	-	-	-	-	-	-	-
Audio-Visual	-	-	-	-	-	-	-	-	-	-	-	-	-
Newsletter	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Participating Students	-	-	2	2	-	-	-	-	-	-	-	-	-
Theses Produced	-	-	-	2	-	-	-	-	-	-	-	-	-

## Research: Wetlands

### Program Element: Wetlands Conservation and Management

**What:** Research on wetlands of New York marine and Great Lakes coasts. **Why:** This research was begun in response to priorities established by Advisory Councils helping shape New York's first Sea Grant proposal. At that time there was great concern for the future of Long Island's tidal wetlands which had been extensively infilled for housing development in the post-war period. Similar concern for the preservation of freshwater wetlands, particularly along the Great Lakes, was generated by flood control and sportfishery interests. **Outcome:** A major effort in wetlands research following upon the initial projects was not commenced because by then state actions towards wetlands management were completed. Products of the initial research were well received. A contribution towards state policies on conservation of freshwater wetlands was made.

Initial wetlands research comprised historical studies of tidal wetlands management on Long Island and small scale demonstration projects on wetlands redevelopment (see Program Development Funds). Plans to broaden the research program were not successful: Research proposals failed to excite reviewers and much work related to wetlands management had already been accomplished by State agencies: The crisis of the wetlands had passed. An interesting side issue was developed by a Sea Grant Intern to the Science Advisor to the State Assembly (see Education and Training) who sought to determine the role of Spartina spp. in determining the mean water mark in tidal wetlands.

A principal product from this research, the book entitled Vanishing Tidelands: Land Use and the Law in Suffolk County, NY 1650-1979 was well received and popular. The review process of the manuscript for that book led, in part, to the development of the Coastal Law Program (see Program Element: Program Support).

A wetlands research initiative on the Great Lakes affected the content of the State's Freshwater Wetlands Act. In the course of that research, several meetings between researchers and Department of Environmental Conservation staff were organized by the Institute to assist in technical input to the Freshwater Wetlands legislation.

With passage of the State's Tidal and Freshwater Wetlands Acts, imperatives for further research diminished. Related research has been undertaken under the Program Elements:

- Great South Bay Study - examination of the role of wetlands in nutrient cycling in Great South Bay;

- Spoil Disposal - Role of rooted-aquatic vegetation in stabilizing spoils and in mobilizing heavy metals from those spoils;

- Program Support - Legal issues surrounding wetlands management.

Table R79. Project Titles

R/M-6	Dynamics of Freshwater Plant Communities along the Eastern Shoreline of Lake Ontario	Geis
R/M-7	Influence of Physical Characteristics of Wetlands on their Use by Spawning Northern Pike	Werner
R/W-1	Demonstration Project in Wetlands Redevelopment	Terry
R/W-2	Historical Aspects of Wetlands Management on Long Island	Ravenaugh
R/W-3	Proposed Modification of Corps of Engineers Disposal Sites as Wildlife Refuges and Breeding Grounds	Sweeney

Table R80. Journal Articles

Terry, O.; Udell, H.; Zardusky, J.  
Tidal Marsh Restoration at Hempstead, Long Island.  
Shore and Beach, October 1974.  
7400

**Research: Wetlands**

**Table R81. Sea Grant Scholars/Theses**

**Current**

NONE

**Graduated, Thesis Submitted**

**Bruce Gilman**

**WETLAND COMMUNITIES ALONG THE EASTERN SHORE OF LAKE ONTARIO**

**7505**

**James Marean**

**THE INFLUENCE OF PHYSICAL, CHEMICAL, AND BIOLOGICAL CHARACTERISTICS OF  
WETLANDS ON THEIR USE BY NORTHERN PIKE**

**7505**

**Table R82. Sea Grant Scholars/First Occupation**

**Bruce Gilman**

**7505**

**Professor, Community College**

**James Marean**

**7505**

**Biologist, NYS Electric and Gas Co., Syracuse**

### Program Development Funds

An important aspect of the National Sea Grant College Program is the flexibility accorded its management through program development funds. These funds provide an ability to quickly meet unexpected needs and situations and to initiate high-risk, speculative research. New York Sea Grant developed several innovative protocols for a variety of uses of program development funds. Examples are:

**Quick Response Grants:** Developed to meet needs of research and extension staff to respond to unusual situations in a timely fashion, Quick Response Grants can be made within hours. Such expenditures are post facto documented by a proposal. Amounts awarded are less than \$5,000, usually less than \$1,000. An example is a grant made to Professor J.L. McHugh, SUNY at Stony Brook, during an exceptionally cold winter, to determine if hard shell clams were being killed by thick ice formation. Local hard clam fishermen felt this to be the case and were calling for some ameliorating action. McHugh's grant, awarded in a matter of days, allowed a quick investigation showing that the ice was not having an effect.

**Mini-Grants:** Extension specialists frequently encounter specific problems requiring investigation by persons having disciplines other than those of the specialist. Most of these situations are of a scale not warranting a "project." To meet these needs, the mini-grant scheme was developed. Having identified a problem and gained approval from the Institute, Extension Specialists identify researchers interested in the problem, work with the investigators in generating a proposal, and see the process through to submission of the proposal to the Institute. The Extension Specialist has continued responsibility for monitoring the research and assuring a satisfactory product. Mini-grants have been successful in building constituent/specialist relationships, developing needed information, and, importantly, directly involving Extension Specialists in the research proposal process. Mini-grants are now awarded to a maximum of \$5,000. Their duration is a maximum of 12 months.

Other uses of Program Development funds include:

**Developmental Funding:** These awards stimulate the development of high risk research areas which typically fail to achieve unanimity in the peer review process. While grants vary in size commensurate with the situation, New York Sea Grant has typically established any activity requiring over \$5,000 as a "project" with appropriate documentation. Projects of over \$5,000 cost may be peer reviewed: Those of over \$10,000 are peer reviewed.

**Supplemental Awards (Cost Extensions):** Unanticipated needs of established projects may be met from Program Development funds.

**Matching Funds Opportunities and Other Special Circumstance Grants:** The Sea Grant Institute may collaborate in symposia, conferences or other meetings multiply funded through use of Program Development funds. In other instances the Institute may participate with agencies of federal, state or local governments, industrial awards or foundation grants in activities directly related to the Institute's priorities. Since these situations are opportunistic, use of Program Development funds affords necessary flexibility.

## **Research: Program Development**

**Initiation of New Projects:** Perhaps no other aspect of New York Sea Grant's management process is less well understood than our program's long-standing practice of initiating new projects outside of the institutional omnibus proposal. Commencing with the appropriation of state dollars in support of Sea Grant activities, and subsequent contractual relationships between the Sea Grant Institute and state agencies in support of research, the Institute has initiated grants in spring and summer months rather than in the calendar year cycle of awards. This procedure results from the schedule of the state fiscal year which commences April 1, making state funds available at that time.

New projects initiated with Program Development funds follow precisely the process of all other project proposals: Project development is undertaken in discussion with the Program Monitor, peer reviewers are selected in concert with specialists in the National Sea Grant College Program, completed peer reviews are shared with the National Office, appropriate documentation is prepared and submitted with a letter of recommendation for approval. Upon receipt of an approval from the program monitor, the award is made.

Several major activities of the Institute have been carried out through the use of a mixture of Program Development and state appropriated funds. These include the Sand and Gravel Mining in Lower New York Harbor Program and the Great South Bay Study.

The following Blue Pages list Program Development awards of less than \$10,000. New project starts costing over \$10,000 are listed with projects in the Research Section.



## Program Development Fund Expenditures

1972-73

### Developmental Grants

R. Baker, Cornell--Program Development in Seafood and Fishery Products--\$7,500

Outcome: Research program in seafood science and marketing

J. Gillespie and G. Poppensiek, Cornell--Program Development to Make a State-of-the-Art Evaluation for Developing a Marine Pathology Competency in the NYS Veterinary College--\$7,500

Outcome: Research program in aquatic pathology

1973-74

### Mini-grant

C. Gehris, SUC at Brockport--Possible Biological Impacts of Opening Irondequoit Bay to Lake Ontario--\$500

(Ext. Spec. Roger Allbee)

Outcome: Local community was able to respond to Corps of Engineers proposal

### Developmental Grants

R. Koehn, SUNY at Stony Brook--Studies of Genetic Differentiation of the Hard Clam, Mercenaria mercenaria--\$XXXX

Outcome: Research program in shellfish genetics

R. Morris, Cornell--Mechanisms to Reduce Urea Content in the Dogfish Shark--\$XXXX

Outcome: Doctoral dissertation

F. Revetta, SUC at Potsdam--Detailed Magnetic Survey of the St. Lawrence River--\$1,500

Outcome: Publication used in power plant siting decisions

R. Rumer and G. Hall, SUNY at Buffalo--Comprehensive Study and Critical Analysis of Oil Spill Containment and Collection Equipment--\$400

(at request of Science Advisor, NYS Legislature)

Outcome: Legislative actions on oil spills

R. Werner, College of Environmental Science and Forestry--Development of a Northern Pike Study--\$1,000

Outcome: Commercially published book on freshwater fishes of New York State



1974-75

Mini-grant

P. Frederick, SUC at Potsdam--An Analysis of Leisure Home Patterns Along the St. Lawrence in Lisbon County--\$588  
(Ext. Spec. Stephen Brown)

Outcome: Publication used in Extension tourism program

T. Brown, Cornell--A Handbook for Estimating Salmonid Fishermen Impacts--\$310

(Ext. Spec. Sandor Schuman)

Outcome: Publication used in Extension sportfishery program

Matching Grant

T. Storch, SUC at Fredonia--Technical Study of Tertiary Effluent Upon Lake Erie Algal Production--\$1,156

(matched by equal funds from City of Dunkirk)

Outcome: Publication used by City in decision on sewerage

Conference

"Sponsorship of the 18th International Association of Great Lakes Research Conference"--\$5,000

Outcome: Co-sponsorship of conference; enhanced visibility of Sea Grant in New York

Special Purpose Grants

A State of the Art Appraisal of Socio-economic and Environmental Impacts of OCS Development of New York--\$2,000  
(a report requested by the Coastal Zone Planning Committee of New York)

Outcome: Report used by City in attempt to attract OCS support industry

W. Reid, Cornell--Re-Vegetation of a Salt Hay Meadow--\$750

Outcome: Unknown

J. McHugh, SUNY at Stony Brook--Fisheries and Fishery Resources of Long Island Sound--\$5,000

Outcome: Dissertation and Assistant Director NY Sea Grant Institute

1975-76

Mini-grants

J. Schubel, SUNY at Stony Brook--Evaluation of a Case Study Based on Historical Data in Assessing and Predicting Effects of Existing and Proposed Shoreline Structures--\$1,000

(Ext. Spec. Peter Sanko)

Outcome: Unknown



T. Brown, Cornell--An Exploration of Water Surface Zoning--\$1,200  
(Ext. Spec. Michael Voiland)  
Outcome: Widely used publication

#### Cooperating Grant

P. Marr, SUNY at Albany--Public Participation Assistance for  
Pennsylvania Coastal Zone Management Program--\$5,230  
(at request of Office of Coastal Zone Studies, NOAA)  
Outcome: Pennsylvania state coastal management program

#### Developmental Grants

D. Cox, SUC at Oswego--Importance to the Macrobenthic Community of  
the Cladophora mats in Lake Ontario--\$3,425  
Outcome: Thesis

D. Morrison, College of Environmental Science and Forestry--User  
Traits of Rented Boats on the Great Lakes--\$4,000  
Outcome: No product

I. Duedall, SUNY at Stony Brook--Environmental Effects of Power  
Plant Calcium Sulfate/Sulfite and Fly Ash in Sea Water--\$6,547  
Outcome: Research program on use of coal waste blocks funded  
by federal and state agencies at about \$3M

#### 1976-77

#### Quick Response Grant

J. McHugh, SUNY at Stony Brook--An Assessment of the Effects of the  
Unusually Severe Winter of 1976-1977 on the Hard Clam--\$945  
(Ext. Spec. David Chase)  
Outcome: Report alleviating fears of effects

#### Mini-grants

R. Adams, SUC at Brockport--Monitoring Braddock Bay Channel and  
Dredged Sediments--\$1,593  
(Ext. Spec. Brian Doyle)  
Outcome: Report to state agency confirming dredge spoil plans

J. Schubel, SUNY at Stony Brook--Evaluation of a Case Study Approach  
Based on Historical Data in Assessing Prevailing Shoreline  
Processes--\$1,000  
(Ext. Spec. Peter Sanko)  
Outcome: Unknown

Yasso, Columbia--Library Research and Synthesis on Marine Career  
Opportunities--\$1,000  
(Ext. Spec. Richard Raymond)  
Outcome: Report to and subsequent Inter-Governmental Personnel  
Agreement to National Sea Grant College Program



Venkatesh, Binghamton--A Tourist Survey of the St. Lawrence River Region--\$1,500

(Ext. Spec. Stephen Brown)

Outcome: Research projects on tourism economics and information used in extension tourism programming

P. Calkin, SUNY at Buffalo--Sedimentation at 12 Mile Creek Inlet--\$1,500

(Ext. Spec. Brian Doyle)

Outcome: Change in state dredging policy

P. Liu, Cornell--Effects of Floating Tire Breakwater at Barcelona--\$1,315

(Ext. Spec. Bruce DeYoung)

Outcome: Research project on FTB's

#### Seminars, Workshops, Conferences

Our Future In Depth, Inc.--A Career Workshop--\$500

Outcome: IPA to NSGCP

L. Hamilton, Cornell--A Seminar on Coastal Zone Management--\$600

Outcome: A seminar series

M. Friedberg, City University of New York--A Seminar on Recreational and Land Use Aspects of Coastline and Shoreline Management--\$2,999

Outcome: Seminar series and publication

M. Bowman, SUNY at Stony Brook--A Workshop on the Roles of Ocean Fronts in Coastal Processes--\$1,500

Outcome: Commercially published book

#### Special Purpose Grants

J. Parker, SUNY at Stony Brook--Assessment of Changes in Shellfish Cultures at the Butler Flowers Shellfish Hatchery--\$3,500

Outcome: Research complimentary of shellfish disease study

J. Schubel, SUNY at Stony Brook--Publication of Report on Stony Brook Harbor--\$1,350

Outcome: Publication

H. Adams, SUNY at Albany--Affecting State Agency Policy Making--\$480

Outcome: Initiation of Policy Studies Group

H. Herman, SUNY at Stony Brook--Development of a Collapsible Underwater Habitat--\$500

Outcome: Underwater habitat constructed

O. Terry and J. Zahradnik, SUNY at Stony Brook and University of Massachusetts--Analysis of Proposed Aquacultural Demonstration and Research Pilot Plant at the Long Island Lighting Company Shoreham Plant--\$1,000

Outcome: Publication



## Developmental Grants

R. Stewart, SUNY at Albany--Wind Energy Assessment in the Coastal Zone--\$10,104

Outcome: Report to state agency

W. Youngs, Cornell--Population Dynamics of the Hard Clam in Great South Bay, New York--\$4,800

Outcome: Thesis; demonstration of need for a Sea Grant professorship in shellfish biology to SUNY at Stony Brook

1978

## Mini-grants

M. Schwartz, SUC at Brockport--Projected Boating Facility Needs and Economic Impact of a Mature Salmonid Sportfishery for the Monroe, Niagara, Orleans and Wayne County Shorelines of Lake Ontario--\$1,424 (Ext. Spec. Michael Voiland)

Outcome: Publication used in extension programming

P. Omohundro, Potsdam--Support for Preparing a Series of Pamphlets Dealing with the Public Aspects of Oil Spills--\$4,894 (Ext. Spec. Stephen Brown)

Outcome: Several publications widely used by New York and other Sea Grant programs

## Workshops

J. Judd, Sea Grant Institute--Great Lakes Contaminants Workshop--\$2,000

Outcome: Program in mirex contamination

J. Schubel, SUNY at Stony Brook--Great South Bay Planning Study--\$5,000

Outcome: Great South Bay Study Plan and program

## Matching Funds Grant

R. Malouf, SUNY at Stony Brook--Study of Spawning of Shellfish in Town of Easthampton--\$2,500

(matched by Town of Easthampton)

Outcome: Town public aquaculture project

## Developmental and Special Purpose Grants

L. Hamilton, Cornell--Development of Guidelines for Tidal Wetlands--\$1,025

Outcome: Doctoral dissertation

H. Herman, SUNY at Stony Brook--Undersea Habitat Refurbishment--\$1,250

Outcome: Remotely controlled submersible constructed



R. Nelson, Binghamton--The Ecological and Economic Impacts of Marine Industries in New York State--\$1,000

Outcome: Support for doctoral student: Ph.D. dissertation

H. Bokuniewicz, SUNY at Stony Brook--Preliminary Study of Groundwater Flow across the Floor of Great South Bay--\$908

Outcome: Research project

#### Supplemental Funds

V. Harms, SUNY at Buffalo--Development of Design Criteria for Floating Tire Breakwater--\$8,968

R. Baker, Cornell--Development of Convenience Products from Underutilized Species of Fish--\$2,000

R. Malouf, SUNY at Stony Brook--Population Dynamics of the Great South Bay Shellfishery--\$2,500

D. Goodrich, Cornell--Structure of Market for Finfish and Shellfish--\$600

P. Weyl, SUNY at Stony Brook--Analysis of Shellfish Sanitation Data--\$600

C. Heatwole, City University of New York--An Analysis of Beach Use Data in the New York City Coastal Region--\$10,000

#### 1979

##### Mini-grant

H. Bokuniewicz, SUNY at Stony Brook--Seasonal Beach Response Along the South Shore of Long Island--\$960

(Ext. Spec. Peter Sanko)

Outcome: Continuing program by Long Island schools

##### Quick Response Grant

T. Brown, Cornell--Comparison of American and Canadian Tourism Industries in Thousand Islands Region--\$1,500

Outcome: Research project

##### Developmental Grants

C. Warner, Cornell--Evaluation of Fish Protein in Milk Replacers for Calves--\$5,500

Outcome: Thesis

E. Baylor, SUNY at Stony Brook--Physical Chemistry of Cell Surfaces--\$1,000

Outcome: Research publication



H. Herman, SUNY at Stony Brook--Undersea Habitats--\$5,000  
Outcome: Submersible chamber constructed with \$25,000 matching grant from Dreyfuss Foundation

D. Cook, City University of New York--An Assessment of Seven Waterfront Public Access Sites to Anticipate Their Potential for Development--\$5,000  
Outcome: None

J. McHugh, SUNY at Stony Brook--Is Extended Jurisdiction Working?--\$900  
Outcome: Research paper

O. Terry, SUNY at Stony Brook--Marine Biomass Studies--\$3,027  
Outcome: Marine Biomass Program

J. Clardy, Cornell--Halogenated Hydrocarbons and Other Metabolites from *Bangia atropurpurea*--\$5,500  
Outcome: Research project

#### Supplemental Funds

J. Timoney, Cornell--Antibacterial Mechanisms in Clams and Oysters: The Contributions of the Water Stream to Bacterial Clearance--\$5,000

B. Paaswell, SUNY at Buffalo--Strategies to Maximize Benefits to Development of the Port of Buffalo--\$600

L. Leibovitz, Cornell--The Pathologic and Immunologic Responses of Commercially Important Species of Long Island Shellfish--\$1,500

Scholar Support for 1979 Initiatives--\$16,500

#### 1980

##### Mini-grants

M. Duttweiler, Cornell--Oil Spill Citizens' Guide--\$1,500  
(Publication funds)  
Outcome: Publication

##### Quick Response Grant

R. Jaeger, New York State Marine Education Association--Development of Local Materials to Supplement and Adapt the Coastal Resource Curriculum for New York State--\$2,000  
Outcome: Publication

##### Developmental Grants

D. Osterberg, SUC at Potsdam--Validation and Characterization of Spawning Sites of the St. Lawrence Muskellunge--\$8,625  
Outcome: Research project



L. McCormick, Southampton Coll.--Preparation of a Book: Coastal Processes and Erosion Problems, South Shore of Long Island, New York--\$9,000  
(cooperative with Office of Coastal Zone Managements, NOAA)  
Outcome: Book anticipated

#### Additional Funds

G. Pontecorvo, Columbia--Seminar on National Accounting Project--\$5,500  
Outcome: Seminar

Scholar Support for 1980 Initiatives--\$33,000

### 1981

#### Mini-grants

F. Domoy, Rochester Institute of Technology--Analysis of Great Lakes Recreation/Tourism Futurescapes--\$3,000  
(Ext. Spec. Michael Voiland)  
Outcome: Publication and new technique for extension

F. Menz, Clarkson University--Studies of the St. Lawrence River Bass and Muskellunge Fisheries--\$3,303  
(Ext. Spec. Stephen Brown)  
Outcome: Research papers

#### Special Purpose Grants

R. Rumer, SUNY at Buffalo--Review and Analysis of Research Needs in Shore Structures and Processes--\$6,850  
(at request of Sea Grant Institute)  
Outcome: Program analysis

W. Lesser, Cornell--The Roles of Cooperatives in Fish Marketing: Evidence from Maine and New Hampshire--\$3,500  
(regional project)  
Outcome: Thesis

B. DeYoung, Cornell--Enhancing Wave Protection with Floating Tire Breakwaters--\$8,000  
(preparation of national report)  
Outcome: Paper

M. Steinberg, SUNY at Albany--Presenting and Analyzing Data on Hard Clam Abundance/Distribution in Great South Bay--\$4,375  
(analysis of raw EPA data for Great South Bay Study)  
Outcome: Research report

#### Developmental Grant

G. Lopez, SUNY at Stony Brook--Spatial and Vertical Distribution of Potential Food for the Hard Clam in Great South Bay--\$5,211  
Outcome: Research project



D. Hirschberg, SUNY at Stony Brook--Extent and Origin of  
Anthropogenic Contamination of Great South Bay Fine-Grained  
Sediments--\$5,500  
Outcome: Research project

#### Supplemental Funds

M. Duttweiler, Cornell--Lake Ontario Recreational Climate Brochure--  
\$3,500  
(publication funds)

B. DeYoung, Cornell--Eastern Long Island Recreational Climate  
Brochure--\$4,500  
(publication funds)

B. Wilkins, Cornell--Additional Funds for Study of Recreational  
Angling--\$8,920

Scholar Support for 1981 Initiatives--\$27,500

#### 1982

##### Mini-grants

J. Peverly, Cornell--Crayfish Production Demonstration Project--  
\$4,232  
(Ext. Spec. Michael Duttweiler)  
Outcome: Pending

R. Smardon, College of Environmental Science and Forestry--  
Perceptual Differences of Beach Users and Management Staff towards  
the Recreational Attributes of the Beach--\$1,790  
(Ext. Spec. Robert Buerger)  
Outcome: Doctoral dissertation

##### Conferences

J. Gannon, SUC at Oswego--Support for the 26th Annual Meeting of the  
International Association for Great Lakes Research--\$4,500  
Outcome: Co-sponsorship

J. Schubel, SUNY at Stony Brook--Shoreline Erosion Workshop: A  
Developmental Grant--\$4,500  
Outcome: Report

##### Developmental Grant

J. Haynes, SUC at Brockport--Recreation Facility Design and  
Environmental Impacts on the Great Lakes: A Developmental Proposal--  
\$9,923

J. Novak, Cornell--New Strategies for Planning and Evaluation for  
Marine Education Programs--\$4,330



#### Supplemental Funds

R. Pierce, Pennsylvania State University--Engineering Studies on the Use of Floating Tire Breakwaters in Severe Wave Climates--\$17,325

#### Regional Project Participation

S. Brandt, SUC at Oswego--Lake Ontario Salmonid Diet Survey--\$6,300  
--Research project

Student/Post-Doctoral Support for 1983 Initiatives--\$79,500

### 1983

#### Mini-grants

T. Brown, Cornell--Updating the Supply of Marinas in Downstate New York--\$2,042  
(Ext. Spec. Bruce DeYoung)  
Outcome: Report

#### Developmental Grant

S. Rizvi, J. Kinsella, Cornell--Assessment of Supercritical Fluid Extraction for the Recovery of Oil and Proteins from Marine Sources--\$9,534

#### Supplemental Funds

R. Reis, SUNY at Buffalo--Problems in Coastal Law--\$8,800

E. Carpenter, SUNY at Stony Brook--Modelling of Nutrient-Floral Relationships in Great South Bay--\$1,640

### 1984

#### Mini-Grant

J. Bowman and J. Miller--The Effects of Sportfishing on the Business Structure of Pulaski, New York--\$5,000  
Outcome: Matched by \$500 from County Fishery Management Council

#### Developmental Grants

C. Hall, Cornell--Simulation of Spatial and Temporal Changes in Primary and Secondary Productivity and Salmon Dynamics of the Northeastern Pacific Ocean--\$1,974

R. McFarland, Cornell--Do Fish Attraction Devices Increase Fish Production--\$9,000



Supplemental Funds

S. Rizvi, Cornell--Assessment of Supercritical Fluid Extraction for the Recovery of Oil and Proteins from Marine Sources--\$3,000

K. Chon, SUNY at Buffalo--Prospects for Waterborne Commerce in the Lower Great Lakes--\$4,980

Continuations

S. Brandt, SUC at Oswego--Lake Ontario Salmonid Diet Survey--\$8,378

# **ADVISORY SERVICES**



Table A1. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Marine Advisory Services	A/D-1	A/S-1											
Eastern Lake Erie Advisory Services				A/S-2									
Extended Jurisdiction Adv. Services							A/S-3						
New York Bight Advisory Services								A/S-6					
Regional Seafood Tech. Adv. Services											A/S-12		
Gateway National Park, NPS								A/S-8	-----C				
LI Recreation Climate Publ. - NOAA										A/S-11	-----C		
Lake Erie Recreat. Clim. Publ. - NOAA								R/C-13	-----C				
Lake Ontario Recreat. Clim. Publ-NOAA								R/C-14	-----C				
Design & Evaluation of Adv. Serv. Proj.												E/K-9	-----
E/V Ontario Project											A/S-13	-----	
National FTB Publication										A/S-10	-----C		

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	26	26	27	25	24	31	28	32	25	31	32	31	34
Percentage of pledged match	-	29	25	20	16	24	23	27	34	29	25	21	31
Percentage of total projects in year	4	3	3	6	3	2	4	8	4	6	7	4	8
Number of participating faculty	1	1	1	2	1	1	2	4	2	4	5	3	4
Disciplines of participating faculty	EXT	EXT	EXT	EXT	EXT	EXT	EXT	EXT	EXT	EXT	EXT FS	EXT	EXT ED
Research Publications - Articles	-	-	-	-	-	-	-	1	-	1	-	-	1
Reports	-	-	-	-	-	-	-	1	1	-	1	-	-
Popular	-	-	-	-	-	-	-	-	1	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	1	-	-
Extension Effort-FTE - Marine	-	1.25	4.3	3.9	5.2	6.95	8.3	8.5	7.5	7.5	6.5	7.5	7.5
Great Lakes	0.3	0.3	3.3	5.3	6.0	6.5	7.4	6.9	6.4	6.4	6.4	6.4	5.4
County	-	-	-	-	-	1.4	1.4	1.0	1.0	1.2	1.2	1.5	1.7
College	-	-	2.6	2.6	5.9	4.2	3.2	3.5	4.0	4.0	3.9	3.1	3.2
Extension Outreach - Publications	-	-	-	-	-	-	-	-	-	-	-	-	-
Information Pieces	-	-	-	1	1	3	-	1	2	1	1	2	1
Audio-Visual	1	-	-	-	-	-	-	-	-	-	1	-	-
Newsletter	-	X	-	-	-	-	-	-	-	-	-	-	-
Number of Participating Students	-	-	-	-	-	-	1	1	-	1	1	1	1
Theses Produced	-	-	-	-	-	-	-	-	-	-	1	-	-

Table A2. Project Titles

A/D-1	Advisory Services	Harrington
A/S-2	Eastern Lake Erie Advisory Service Project	Wilkins
A/S-3	Advisory Efforts - Extended Jurisdiction	Wilkins
A/S-6	Advisory Service Efforts on Critical Issues of the New York Bight	Wilkins
A/S-8	Marine Youth Education Project, Ecology Village, Gateway National Recreation Area	Squires/ O'Dierno
A/S-10	Enhancing Wave Protection with Floating Tire Breakwaters	DeYoung
A/S-11	Eastern Long Island Recreation Climate Brochure	DeYoung
A/S-12	Extension Position in Seafood Technology	DeYoung/ Kinsella
A/S-13	E/V <u>Ontario</u> Project	Voiland
E/K-9	Cooperative Research and Education Project: New Strategies for Design and Evaluation of Marine Education Programs	Novak
R/C-13	Lake Erie Recreation Climate Brochure	Duttweiler
R/C-14	"Lake Ontario's Recreation Climate" Publication	Duttweiler

**Advisory Services: Summary**

**Table A3. Journal Articles**

Duttweiler, M.; Voiland, M.  
Programming Tomorrow's Tourists.  
Extension Review, Winter 1984.  
8400

Voiland, M.  
The Economic and Social Impact of a Developing Salmon Sport-fishery: The Case  
of the 1978 Rochester-Lake Ont. Trout & Salmon Derby.  
Recreation Impacts: The Great Lake Ecosystem, Mongraph 1. August 1979.  
7900

Voiland, M.  
The Lake Ontario Salmonid Sportfishery: Some Economic Research Needs.  
NYS Chapter of the American Fisheries Society, Marcy, NY, 13 February 1981.  
8100

Table A4. Sea Grant Scholars/Theses

Current

NONE

Graduated, Thesis Submitted

\*Robert Buerger

THE PERCEPTUAL DIFFERENCES OF BEACH USERS AND MANAGEMENT STAFF TOWARDS THE  
RECREATION ATTRIBUTES OF THE BEACH  
8205

Graduated, No Thesis Required

Stephen Brown  
Sandor Schuman

Status Uncertain

\*Michael Brody

Table A5. Sea Grant Scholars/First Occupation

Michael Brody

8407

Asst. Professor of Education, Univ. of Maine

Stephen Brown

8308

Extension Specialist, NY Sea Grant Extension Program

Robert Buerger

8205

Extension Specialist, NY Sea Grant Extension Program

Sandor Schuman

7905

PhD candidate, SUNY/Albany (Public Administration)

New York Sea Grant Advisory Service

**In the Beginning:** Site visitors reviewing New York's first Institutional proposal seemed genuinely surprised that it was proposed to start extension at such a large level--25% of the requested federal funds. They questioned if an Advisory Service team of five persons could be put in place in the first year. Now, when Advisory Services average somewhat over 25% of federal Sea Grant expenditures, the size of the first request does not seem out of line. But in 1971, the average funding for Advisory Services was substantially less than 10%. Why did New York propose so large an initial investment? The request reflected the commitment to Advisory Services of the director-to-be and the belief that quick development of field staff would aid the program in gaining credibility. The approval of the request reflected the persuasiveness of Clifford Harrington, then Associate Director of New York's Cooperative Extension Service, and the confidence felt in his vision of a Sea Grant extension effort.

**Building the Network:** A guiding philosophy of New York Sea Grant in the beginning was that an early impact was necessary if New York State leaders and citizens were to believe in and support "one more Federal program". Advisory Services were an appropriate way to generate demonstrable benefits among New York coastal users. Harrington, following a principle recognized as valuable in stimulating innovation in large organizations, created an "entrepreneurial unit"--Sea Grant--within Cooperative Extension. Initial Sea Grant Advisory Service efforts evolved to today's "Sea Grant Extension Program," one of five major elements in New York's Cooperative Extension. The Sea Grant Extension Program today utilizes one-third of New York's Sea Grant funds and its staff are housed at six State University of New York locations and in four County Cooperative Extension offices providing access to all of New York's coastal region. Housing Extension Specialists on State University campuses has helped reinforce the collaborative nature of the program and involve State University researchers in Extension activities. Growth of extension professional staff supported by Sea Grant federal and state funds, is shown in Figure X. This tabulation does not include campus-based specialists, faculty having extension responsibilities, or county supported extension personnel.

**Evolutionary Changes:** To obtain the immediate impact sought, initial Advisory Service staffing focused on locating federally funded specialists in key coastal communities. This goal was quickly achieved so that by 1976 our five-year plan called for expansion of college and county staff but no increase in numbers of up-state regional specialists. Current staffing of New York Sea Grant Extension reflects these changes. By the end of 1984, Great Lakes Sea Grant Specialist positions will have declined from seven to five, while Marine District Specialist positions will have increased an equivalent amount to 7. Campus-based staff in turn have increased by 3 while county-based staff (with 20-40% time devoted to marine assignments) have risen from 0 to 6. Sea Grant provides partial support for two of those county positions, but county governments provide over \$100,000 in support of Sea Grant Extension efforts.



**Program Leadership:** As staff numbers increased and educational programs being carried out became more comprehensive, there was need for additional leadership. Two Program Coordinator positions were created having responsibility for the Great Lakes and Marine Districts respectively. The program leader and both program coordinators keep some educational program responsibilities so that, in total, somewhat over one fulltime equivalent leadership position is involved in the three positions: Program leader; marine district coordinator; Great Lakes coordinator. Having the Marine District Program Coordinator located in a field office has been a successful innovation, one unique within New York Cooperative Extension.

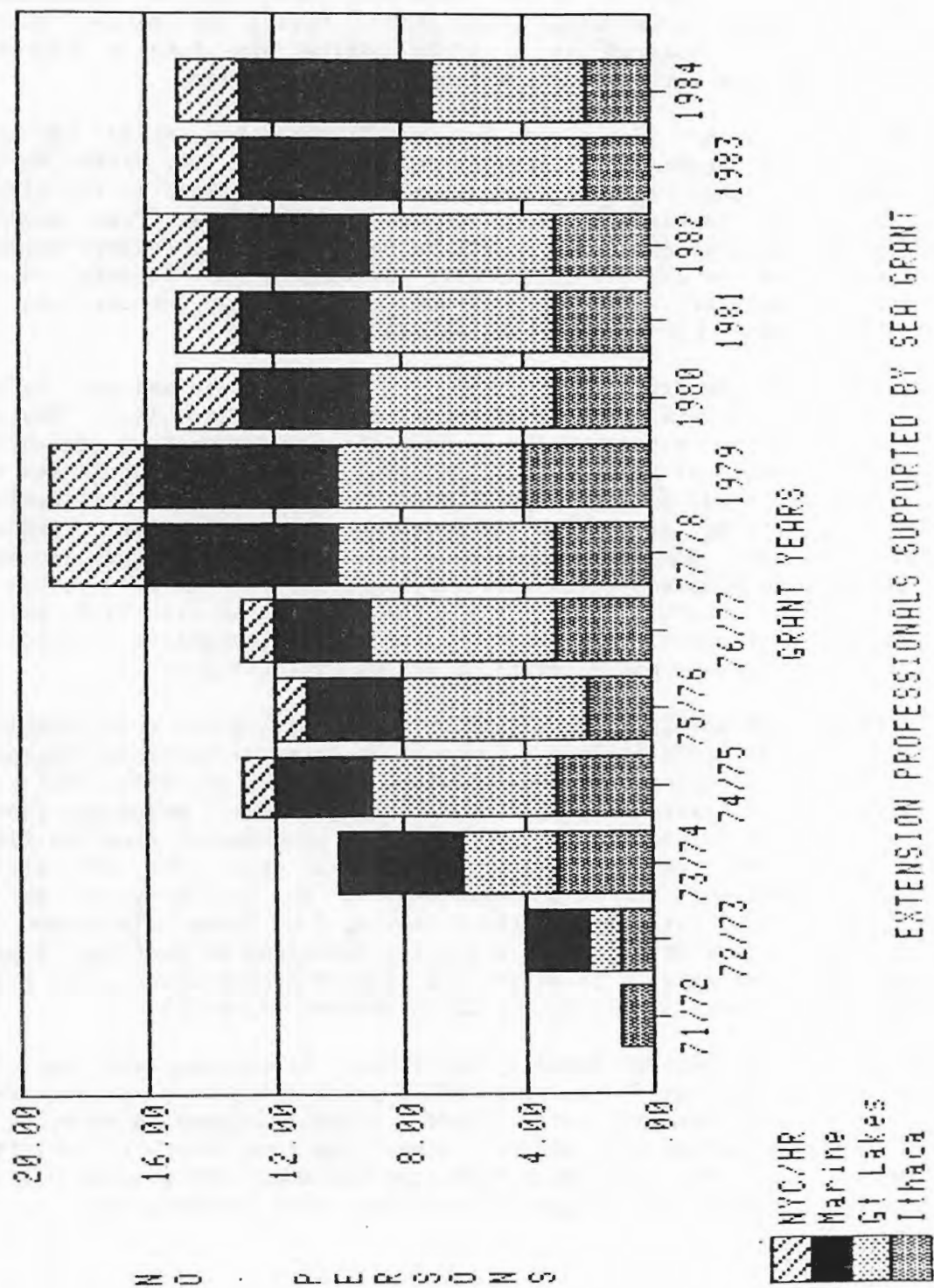
**Innovation:** New York's Sea Grant Extension program has tried new ideas successfully. This program was first, or among the first, to: establish Quick Response Research funds requiring Extension staff involvement in the planning and monitoring of research needed; use the title "Sea Grant Extension Program"; establish a graduate assistantship for those with Advisory interest; establish workshops for new and prospective Advisory Service leaders; develop a Coastal Extension Professional Association. A challenge for the future is to retain and nourish that innovative attitude.

**Establishing Extension Program Priorities:** A variety of formal and informal mechanisms are used in setting Sea Grant Extension priorities. The most fundamental approach is through the Program Advisory Committees established for each of our regional programs. These groups of local leaders serve to identify community needs and their priorities, assist in the identification of research opportunities and assist in the conduct and evaluation of specific educational programs. Committees have been formed by subject area, geography, or special program purposes--each with varying results. In all cases, our professional staff are urged to view the committee as an essential part of their program determination process and one which requires considerable investment of development and maintenance effort on their part.

**Extension Program Planning:** Program and organizational goals were established in 1975 and reviewed again in 1983. These goals have guided major program and staff allocation decisions in the following years. In 1975, all staff participated in an exercise projecting staffing needs, assuming generous fiscal resources, in an effort to tease out major programming opportunities in the next 15 or so years. The organizational objectives and staffing projections established in 1975 were combined in the document entitled "Looking Towards 1990" presented in the following Blue Pages. This and other similar documents have been the basis for key decisions on staffing programs as well as communicating with leadership of related organizations. Our program is so dynamic that long range planning is considered essential.

**Plans of Work:** As part of Cornell Cooperative Extension, all Sea Grant Extension professional staff are required to prepare 4-year plans of work for their major program areas to provide overall organizational direction. New York Sea Grant Extension also develops annual plans of work with objectives and activities. These are based on a situation statement and program plan. The 1984 Situation Statement and Program Plan follows this introduction.

Figure A1. Professional Extension Staff Supported by Sea Grant Funds



**Program Evaluation:** Evaluation plays an important role in New York's Extension Program. It is part of the organization's culture, its norm. Staff training includes segments on effective evaluation procedure, staff are expected to conduct a structured evaluation annually, performance reviews regularly seek audience input, staff monthly narratives focus on impacts rather than activities. The size and dispersed nature of New York's Sea Grant Extension efforts may have made structured evaluations particularly valuable. They are used for many purposes including increasing the effectiveness of our work and helping others more readily grasp the value of Sea Grant. Evaluations aid both managers and staff in programmatic and personnel decisions for well done evaluations typically document for staff the great value others find in their work. We commit time to evaluation: We believe it is time well spent.

**Staff Development:** Education is personnel intensive. Recruitment, training and retention of only the best staff is required for a highly effective Sea Grant extension program. Thus New York has a strong commitment to staff training and career development. A few examples of that commitment are:

- o establishment of limited term specialist positions;
- o provision of staff graduate study stipends;
- o extensive personnel performance reviews;
- o provision of leadership opportunities to staff;
- o development of assistant leader positions ("program coordinators").

Related efforts emphasizing staff development nationwide have included initiation of a Mid-Career Leadership Workshop (5 states represented), New Program Leaders Workshops (8 states represented) and a Coastal Extension Professional Association. Other national spinoffs occur. Recognition of Advisory Service staffs was a topic first raised in 1976 by New York with assembled Advisory Service Program Leaders. Today, three regional advisory service awards are given.

**Program Graduates:** New York's Sea Grant Extension Program has always given high priority to the training of new extension persons. One portion of that training has been the movement of Extension Specialists from New York Sea Grant to other occupations. Table A6 lists the present occupations of some of the program's "graduates."

**Research Linkages:** Strengthening the feedback loop between researchers and users has been a continuing program goal. In pre-College days Sea Grant Extension staff (and Advisory Committees) had major input to the research call-for-proposals and in reviewing proposals. As research policies were altered (see "The Research Program") and as more fundamental and less site specific research was addressed, alternative mechanisms for Extension-Research linkages were tested. Surviving from these tests is a pattern of extension staff input to the call-for-proposals, review by extension staff of appropriate research proposals received and commitment of extension staff for liaison with selected principal investigators. The Quick Response Research Projects are a mechanism facilitating extension focussed, short term research. Linking research and extension may be easiest within faculty having both research and extension commitments but we use many other means to link users and researchers: A tour and office conference, a seminar focussed on acquainting faculty with coastal problems so needed research may result from such mechanisms.

Advisory Services: Management

Table A6. Present Occupations of Former New York Sea Grant Extension Specialists  
In Sea Grant

Dale Baker	Director, Sea Grant Extension, Univ. Minnesota-Duluth
Brian Doyle	Coordinator, Marine Adv. Serv., Univ. of New Hampshire
Larry Leopold	Leader, Advisory Services, Univ. of So. California
Norman Bender	Marine Extension Specialist, Univ. of Connecticut
Nicholas DeGeorges*	Agent, California Cooperative Extension
Michael Haby*	Sea Grant Extension Specialist, Texas A&M University
Christine Hagerman	Extension Specialist, Illinois-Indiana Sea Grant
Tom Mack*	Sea Grant Extension Specialist, Univ. of Minnesota
Mark Malchoff*	Extension Associate, Cornell University
Ed Matthews*	4-H Agent, Suffolk County, New York

Outside of Sea Grant

Roger Allbee	Farm Credit Bank, Springfield, Massachusetts
Stanley Boc*	Coastal Engineer, US Army Corps of Engineers
Linda Camp	Editor, Cooperative Extension, Univ. of Minnesota
James Daniels	Doctoral candidate, Food Science, Cornell
Douglas Gordon	National Food Institute, Washington
Richard Gross	National Park Service, Washington, DC
Gay Hawk	Publicist, Public Health effort, Florida
Jeffrey Overton*	Planning Consultant, Long Island
Richard Raymond	NYS Assembly Commission of Science and Technology
Pete Sanko	Coastal Consultant, Long Island
Sandor Schuman	Director of extension effort, NYS Energy Office
Rick Sojda	Refuge Manager, USF&WS
William Walters	Conservation Officer, Alaska
Sally Wilson	Public Relations, Columbus, Ohio

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\* Participant in Term Specialist Program

To speed up users learning of research, newsletters, radio or meetings may be helpful. Ten researchers presented yet-to-be-published research to the many hundreds at the 1984 Long Island Fisherman's Forum. That audience would not have assembled without Sea Grant and much of the research would not have been undertaken without Sea Grant. By bringing together the audience and researchers, the two-way information flow that resulted, characterizes results from effective research linkages.

**Summary:** Development of strong educational programs are the conerstone of New York's Sea Grant Extension Program. A close link to research, extensive use of Advisory Committees, longer range planning, management by objective, conducting structured evaluations and enhancing staff competency have been consistent components of our first dozen years. We see those as integral to any Sea Grant Extension program successful in the roles of:

- o transferring knowledge in a form useful to people;
- o stimulating adoption of knowledge by appropriate people;
- o stimulating research needed to solve coastal problems.

**SITUATION STATEMENT**

**AND**

**PROGRAM PLAN**

March, 1984

New York Sea Grant  
Extension Program

Fernow Hall  
Cornell University  
Ithaca, NY



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## PROGRAM PERSPECTIVE

### Background

The National Sea Grant mission to enhance appropriate use of our marine and Great Lakes coastal resources is carried out in New York by the New York Sea Grant Institute. The advisory service effort called for in Sea Grant enabling legislation is conducted in New York through Cooperative Extension; staff carrying forth that work are New York Cooperative Extension employees.

Eighty-five percent (15 1/2 million) of this State's residents live in the 28 counties bordering the Great Lakes, marine coastlines and tidal waterways.

Only in New York are significant coasts present on both the Great Lakes and the Atlantic Ocean (600 and 1800 miles respectively). The problems and potentials along these valuable coastlines - where people live, work and play -- are many and diverse.

### Our Role

The role of the Sea Grant Extension Program in New York is to carry out educational efforts that will help coastal residents, users and decision makers resolve current and projected problems, while developing and conserving coastal resources. To carry out this role the Extension Program:

- Transfers knowledge to persons who can use it to solve coastal problems.
- Stimulates appropriate persons to apply this knowledge to solving problems.
- Stimulates researchers to generate knowledge needed to solve coastal problems.

These roles are carried out by:

- Identifying problem-solving educational programs and activities with: commercial fishermen, marine recreation industries, seafood processors and handlers, consumers of marine foods, marine mining industries, coastal zone decision makers, coastal property owners, marine recreationists, urban minority youth, and others.
- Maintaining and further developing working relationships with other agencies and groups so resources are used more efficiently and programs are implemented more effectively.
- Assisting in developing the directions of future Sea Grant research efforts so they are in accord with needs of the coastal users and the welfare of society.
- Increasing the proficiency of the Extension Program staff to execute programs relevant to the needs of coastal users.

### Staffing

To carry out these tasks, there were 19 professional positions in the Sea Grant Extension Program as of January 1984 supported in full or part by Sea Grant funds. These include Specialists at: Extension offices in New City, East Aurora, Fredonia and Plainview; State University campuses at Stony Brook, Brockport, Potsdam and Oswego; and, the Cornell University Laboratory at Riverhead. Located in Ithaca are a Program Coordinator, Associate Director of the Sea Grant Institute, marine economist (15%), and a recreation researcher (30% extension time). An additional position in Nutritional Sciences at Cornell supports education efforts in seafood nutrition. The second Program Coordinator is located at the Riverhead office. Campus-based positions, one in shellfish biology at the State University at Stony Brook; and, the other in Great Lakes fisheries management at the State University at Oswego and Syracuse, provide competencies in these areas.

### Longer Term Goals

The programs of Sea Grant Extension Specialists vary according to the needs in their geographic areas, but often problems are common to several regions and the nation at large. Following are situation statements describing major problems involving several regions. Long-term educational objectives to resolve such problems are noted. Programs of limited effort or duration have not been included.

## Another Way of Looking At Us

The body of this document is organized by technical subject areas as outlined in the Table of Contents. These subjects reflect the research competencies of the New York Sea Grant Institute and the technical specialties of our extension staff. Unfortunately, technical terms which may be clear to researchers or those educated in marine science can be meaningless to most people. What follows is an attempt to portray our educational programs in terms of themes which apply to our different audiences. Hopefully, one can identify her or his primary interests in the themes, see which audiences each theme is geared toward, review the primary emphases of each theme and then refer to appropriate technical headings for specific information. In effect, this is meant to be a user's guide for the following situation statements.

### 1. "Living on the Shoreline"

Audience: Owners and renters of coastal property

Emphases: Protecting your investment in coastal property  
Enhancing your investment  
Living safely on the coast  
Special problems of coastal property owners

Technical Subjects: Coastal Erosion (p.4)

### 2. "Coastal Enjoyment"

Audience: Those who do and might use the coast for recreation

Emphases: How to use the coasts for recreation  
Where to use the coasts  
Safety and health considerations

Technical Subjects: General Tourism Development (p.4)  
Consumer Use of Seafoods (p.22)

### 3. "Tourism Dollars and Sense"

Audience: Businesses which derive their income from coastal tourists

Emphases: How to accommodate and serve tourists  
How to manage coastal tourism business  
Options for expanding tourism businesses  
How to manage and protect facilities

Technical Subjects: Recreation and Tourism Business Development (p.12)  
Enhancing Coastal Tourism Facilities (p.14)

### 4. "Caught in New York"

Audience: Fin and shell commercial fishers  
State and local governments and agencies  
Aquaculturists  
Seafood processors

Emphases: Seafood facilities development  
Technological innovations  
Business and facilities management

Technical Subjects: Commercial Fishing Industry (p.16)  
Seafood Marketing (p.18)  
Seafood Technology (p.20)

5. "Food from the Sea"

Audience: Consumers of fish and shellfish  
Home economists and nutritionists  
Marketers of fish and shellfish

Emphases: Best handling practices  
Nutritional information  
Preparation techniques  
Safety considerations

Technical Subjects: Consumer Use of Seafoods (p.22)  
Seafood Marketing (p.18)

6. "Shoreline Construction and Protection"

Audience: State and local governments and agencies  
Marine contractors  
Shoreline property owners

Emphases: Coastal engineering and design basics  
Options for shoreline protection

Technical Subjects: Coastal Erosion (p.14)  
Enhancing Coastal Tourism Facilities (p.14)

7. "Managing the Shoreline"

Audience: State and local governments and agencies  
Various coastal interest groups

Emphases: Waterfront redevelopment strategies  
Erosion management options  
Tourism development options  
Fishery development options

Technical Subjects: Coastal Resource Protection and Development (p.1)  
Coastal Erosion (p.4)  
General Tourism Development (p.7)  
Commercial Fishing Industry (p.16)

8. "It's Your Coast"

Audience: Those with general interests in the coasts  
Youth

Emphases: Current coastal issues  
Public participation in coastal decisionmaking  
Leadership development in coastal interest groups

Technical Subjects: Coastal Resource Protection and Development (p.1)

## COMMUNITY RESOURCES DEVELOPMENT - COASTAL RESOURCE PROTECTION AND DEVELOPMENT

### Background

Many coastal issues do not fit easily within a single technical category either because they are truly interdisciplinary in nature or because they represent social rather than technical decisions. Such issues are the subject of this statement.

One of the most important issues that faces New York's coasts is multiple-use conflicts. Competition is prevalent between industrial, commercial, recreational, environmental and residential uses since over 80% of the New York population lives within coastal counties. Demand for water supplies, waste disposal, recreational opportunities, industrial shoreline access, and a quality living environment--often all along one connecting piece of shoreline--creates development pressure greater than in most inland areas.

For example, shipping and related facilities often conflict with neighboring uses. Residents along both Lakes Erie and Ontario and the St. Lawrence River must balance the economic, environmental and social concerns associated with proposed winter navigation. The economical benefits accrue from increased shipping traffic which could decrease costs for transporting goods to and from this industrialized and agriculturally oriented region. Debate continues about potential detrimental effects of winter navigation due to the concerns of mobile ice and changed water levels, damages to both man-made structures and fish and wildlife, and concerns about winter transportation to islands.

Continued advances in the improvement and protection of the environmental quality of our coasts is a statewide concern. Spills of oil and other hazardous cargo along both the freshwater and marine coasts of New York pose significant environmental and safety threats. This potential problem could enlarge because Great Lakes shipping is expected to increase in the future. Due to increased shipments of coal, the Port of Buffalo is considering expanding and modifying its unloading facilities. On the St. Lawrence River additional locks and connecting channels are being proposed to allow winter navigation and to accommodate larger ships.

Currently federal support to mitigate environmental impacts is declining. Yet to meet the need for clean water and air, a healthy fish and wildlife habitat and a generally aesthetically-pleasing coast, dollars and expertise are needed to continue improvements in domestic and industrial waste treatment and proper dredging and dredge spoil disposal.

In our urban areas, decaying waterfronts represent a tremendous resource for economic development projects. Changes in transportation modes and deteriorating surrounding neighborhoods are some reasons for reduction in manufacturing and commercial activity along urban waterfronts. The revitalization of these areas is one of the most effective means of encouraging economic development without at the same time consuming valuable suburban and rural open space. New York City with its 578 miles of waterfront is particularly suited for such development, although Buffalo and Rochester need to make, and have been making, great strides in this area.

Waterfront revitalization also can occur in rural areas. For example, the Town of Sodus on Lake Ontario was assisted with actions to protect and restore its historic lighthouse as a maritime museum. Many small towns on the Great Lakes and in the

Hudson Valley Region also see a need to revitalize their waterfronts. Waterfront revitalization also can take the form of enhancing public shoreline parks or historical and cultural sites.

The State government has recognized the importance of waterfront revitalization and its encompassing issues by passing into law in June 1981, the "Waterfront Revitalization and Coastal Resources Act." This law provides the legal authority to establish a coastal program in the State. It establishes State coastal policies, establishes a coastal boundary, provides for optional local government waterfront revitalization programs, and establishes a process of coordination of State actions and programs. The program was approved by the U.S. Department of Commerce in September 1982. Since that time, guidelines and regulations for the implementation of the program have been promulgated and are being phased in for implementation. During 1983, 63 coastal communities received over \$1.1 million in planning assistance grants (matched by an equal amount of local funds) for the purpose of preparing local waterfront revitalization plans. This represented about 50% of the State's shoreline, and nearly 85% of the total New York coastal population. For 1984, an estimated 1/2 million dollars will be granted to another 30 communities for coastal planning efforts. Identification and mapping of coastal erosion hazard areas are well along on both the State's Great Lakes and marine coasts.

#### Problems

The State's coastal zone includes 28 counties, 112 towns, 103 villages, 25 cities, and 4 Indian Reservations, with 84 percent of the State's population. In New York City there are 50 community planning boards and more than 20 other agencies with coastal jurisdiction. In addition, there are well over 40 federal programs or departments actively involved in coastal decision-making. Authorities in the various governmental levels are often overlapping and distinctions become blurred.

Private citizens, community groups, local governments and coastal businesses often have difficulty dealing with mountains of information and red tape to adequately formulate plans and decisions relating to complex coastal issues.

A fundamental dilemma exists regarding how to best involve communities in decision making. Though mechanisms exist, community leaders are often inexperienced in using them or are unaware of their limitations.

Communication, public participation and a thorough understanding of the issues are key elements in devising plans, decisions and inputs. Yet, education is often missing, or only superficially used, when agencies and groups attempt to muster community support on important issues. Breaking down barriers of self-interest and lack of information with factual presentations is not easily done. Often it requires a neutral, trusted information source.

Technical information, whether it be related to energy facilities, economic development or legislation, is often not available in a form readily understandable to community leaders or the general public. Assistance is needed to translate available data into a useful product.

The New York Coastal Management Program is one of the most complex pieces of legislation with which local governments will have to deal. Since some elements of the program will be voluntary, and others mandatory, it's essential that towns, villages, and cities understand the full ramifications of their decisions. Knowledge may be lacking



in grant-proposal writing skills which will be necessary to compete for the newly available funds. Staff with a range of expertise in coastal matters often are not found at local levels.

#### Approach

Public awareness of coastal resource problems and understanding the need for effective planning is important. Sea Grant can facilitate communication and cooperation among coastal users and decision makers, providing information on potential impacts of various decisions. Public management and educational agencies will be assisted with educational programs on coastal management issues.

Greater community input can be fostered by educating community leaders on the different aspects of public participation. At the same time, Sea Grant can provide direct assistance to communities and special interest groups by working in concert with other appropriate groups and agencies to interpret research projects, identify potential government assistance programs, and explain procedures for effecting change.

Assistance in review of alternative development strategies, land use analysis and economic return theory are particularly well suited for urban area decision makers concerned with waterfront development.

#### Objectives

Have diverse coastal interest groups minimize unproductive conflicts by fostering cooperation and coordination.

Have decisionmakers in coastal communities become familiar enough with coastal erosion processes and alternative control methods to implement coastal erosion hazard areas regulation at the local level.

Stimulate awareness of coastal issues/resources among user groups and community leaders, in order to have them become more effective in influencing shoreline use decisions.

Provide community groups, government officials, and private entrepreneurs with technical analyses, based on state of the art research, which can be used to fully evaluate proposed shoreline use.

Encourage local governments and special interest groups to fully explore the potential benefits and restrictions which participation in New York's Coastal Management Program could bring, helping them to mold the program to best suit their needs.

Stimulate economic development of underutilized coastal areas.

## COASTAL EROSION

### Background

Coastal erosion in New York is as varied, complex and extensive as the 2400 miles of coastline. New York's coastline is characterized by a wide variety of water types and shoreline forms. In between the extremes of the Atlantic Ocean and the Great Lakes, there are numerous bays and sounds of all sizes and descriptions, and two major rivers, the Hudson and St. Lawrence. Barrier islands, beaches wide and narrow, high and low bluffs--some composed of sand and gravel, others almost entirely of clay--coastal plains and wetlands all are found. Along most of this coastline, erosion rates are moderate to high, with long term (100 year) rates of 1 to 4.5 feet per year and short-term (15 year) rates as high as 10 to 12 feet per year.<sup>1</sup>

The social and economic losses created by erosion are directly proportional to coastal use, developmental density and property values. Long Island, New York City and the Lower Hudson Valley, with a combined population of over 12 million, has one of the most highly developed coastlines in the nation. Nassau and Suffolk Counties on Long Island, with a population of almost 3 million, account for only 0.6 percent of the nation's shoreline, but 10 percent of its critical erosion areas.<sup>2</sup> Total annual erosion costs for Nassau and Suffolk are estimated at \$14 million (1970 price levels). In the event of the standard project hurricane (100 year storm), it is estimated that for the shoreline from Fire Island Inlet to Montauk alone, \$672.6 million in damage (1973 price levels) would result.<sup>3</sup>

Along most of the south shore of Long Island, Coney Island and Staten Island the U.S. Army Corps of Engineers has had congressionally authorized hurricane flooding and erosion control projects in the planning stage since the early 1960's. However, due to local concerns over environmental impacts, project design and high costs to state, county and city governments, only small sections of these projects have been implemented. Therefore, as with the remainder of the coastline, which does not qualify for federally funded erosion control projects, the financial burden of erosion losses and erosion control efforts falls upon property owners, both public and private.

Although development along the Lake Erie and Lake Ontario coastlines is less dense than the state's marine coastline, erosion losses are high. This is due, in large part, to periodic high water levels. Along Lake Ontario, short term erosion rates of up to 12 feet per year have been correlated with higher water levels. In 1973, approximately \$25 million in damages were incurred along the coast of Lake Ontario and the St. Lawrence River during a period of near-record high water levels. Damages which occurred during the spring of 1976 were estimated to be over \$2 million. In a recent study, it was found that New York residents along the Great Lakes spent nearly \$60 million on protective structures during the 1972-76 period. This compares to the nearly \$45 million incurred in damages during that same time. Because of special design requirements, less than half of 470 protective structures examined in the Eastern Lake Ontario region were of more than limited effectiveness.

In an effort to help assure effective coastal erosion planning and management, and to reduce the long-term social, economic and environmental costs of erosion and erosion control, the New York State Legislature enacted in 1981, the "Coastal Erosion Hazard Areas Act" as part of its Coastal Management Program. This Act requires local governments to develop and implement erosion management plans and

regulations requiring setbacks and control over the application of erosion control methods, both structural and non-structural. If local government does not carry out these responsibilities the State has authority to do so.

### Problems

A wide variety of audiences in the private and public sectors require reliable information upon which to base decisions regarding erosion planning and management, the use of and investment in eroding coastal property, and the selection, design, implementation and maintenance of erosion control measure and projects. Specific problems include:

- Improper selection of erosion control methods, which often leads to full or partial failure, continued or increased erosion, environmental degradation and higher costs. Some examples are: (1) failure to recognize and control bluff or upland drainage problems, (2) failure to utilize vegetative erosion control measures, (3) building an expensive erosion control structure where a non-structural control such as moving an upland facility would be less expensive, (4) constructing groins and breakwaters without regard for accelerated downdrift erosion, (5) constructing types of shoreline hardening structures that result in loss of desirable beach in front of the structure, and (6) stabilizing inlets without providing for sand bypassing or downdrift beach nourishment.
- Improper design and construction of structural and non-structural erosion control devices that result in premature failure, incomplete protection and higher initial or long-term costs. Some examples are: (1) inadequate toe protection, (2) excessive overdesign, (3) improper material selection and specifications, (4) poor selection of design wave and water level conditions, and (5) improper selection, planting and care of stabilizing vegetation.
- Purchasers of coastal property often buy without knowledge or awareness of the erosion situation, the condition of existing erosion control structures and the high cost of erosion control. This often results in financial losses through: (1) having to resell the property, or (2) having to invest unanticipated large sums of money in erosion control.
- Poor coastal land use and development practices often initiate or aggravate erosion conditions. Some examples are: (1) devegetation of upland and bluffs for aesthetic, scenic or access purposes, (2) destruction of sand dunes to obtain better view and larger building area, (3) regrading of upland that directs runoff towards bluff, (4) placing septic systems and heavy loads such as swimming pools too near the bluff edge, (5) locating permanent structures with inadequate floodproofing in the flood plain, and (6) mining or excavating coastal sand and gravel deposits in such a manner that fish and wildlife habitats are destroyed and coastal erosion is accelerated.
- Overemphasis on shoreline stabilization, especially by structural means, in coastal areas where significant amounts of littoral sediment is derived through erosion of the shoreline and adjacent uplands, is leading to accelerated erosion and a loss of beaches. This, in turn, leads to increased structural failures, due to loss of protective beaches, and the need for more substantial and costly structures.
- Local government, generally, has insufficient knowledge and understanding of coastal erosion, processes, erosion control methods and management options to maximize the effectiveness of erosion management planning required by the New York State Coastal Erosion Hazard Area Act.
- Property owners are not often able to recognize the need for and methods of structural repair and maintenance, nor are they able to diagnose impending structural failures.

### Approach

Educational programs to solve coastal erosion problems should focus on:

- Techniques for aiding property owners to analyze the causes, severity and extent of coastal erosion problems.
- Techniques for having property owners able to evaluate and select structural and non-structural erosion control methods, within the framework of erosion assessment, economics and environmental impacts.
- Management alternatives for use by local government in implementing the "Coastal Erosion Hazard Areas Act".
- Techniques for expediting permits for coastal construction.
- Proven low-cost erosion control methods.
- Techniques for evaluating the condition of existing structures.
- Techniques for appraising or assessing the values of shoreline property, and understanding the impacts of coastal erosion on those property values.
- Methods for the inventory of coastal information and its use in decision making.

### Objectives

Have property owners, prospective property owners, contractors and local governments able to conduct erosion assessments on which to base erosion mitigation decisions, plans and investments.

Have property owners, engineers, and contractors evaluate nonstructural vs. structural means of erosion control.

Have engineers and contractors maximize the effectiveness of structures through proper design and materials selection.

Have property owners, engineers, contractors and local governments evaluate the environmental impacts of erosion control decisions.

Have local governments consider alternate management strategies for coastal erosion hazard area planning.

Have property owners, prospective property owners, realtors, appraisers, and assessors evaluate the effect of coastal erosion and erosion control activities on the value of shoreline property.

### References

1. Long Island Regional Planning Board. Coastal Zone Management, Coastal Erosion Sub-plan. 1978.
2. U.S. Army Corps of Engineers. National Shoreline Study. 1971.
3. U.S. Army Corps of Engineers. Draft Environmental Impact Statement, Hurricane Flooding and Erosion Control Plan - Fire Island to Montauk, NY. 1973.

**COASTAL RECREATION AND TOURISM: DOLLARS AND SENSE**  
**--AN ECONOMIC DEVELOPMENT STRATEGY--**

Coastal recreation and tourism is a major program area of Sea Grant. Approximately 25% of extension effort is invested in this program area. Past programs have dealt with: improving recreational access, assisting lakeside communities to capitalize on the emerging salmonid fishery, strengthening the capabilities of marina, boatyard, and charter/rental boat businesses, determining the factors influencing coastal recreation use, and developing tourism. Future efforts are aimed at assisting the state and local communities plan and manage coastal recreation and tourism and to have businesses manage profitable enterprises and design and build cost effective facilities.

Moving Toward the Future:  
Managing, Planning, and Developing Coastal Recreation and Tourism

Background

The coastal areas of New York State can be described as an aquatic playground. Residents and visitors alike travel to the shores to partake of an abundant variety of recreational opportunities.

Out-of-water activities such as viewing scenery, sightseeing, and visiting parks are by far the most popular activities.<sup>1</sup> Swimming, fishing and boating also are actively pursued. Estimates (1975) indicate that 229 million swimming days, 44 million angler days, and 10.5 million boating days take place each year in New York State.<sup>2</sup> Obviously, the recreational activity pattern varies from place to place.

New York City and Long Island are on the marine coast. This, the State's largest concentration of residents, as well as visitors who travel to partake of the city's shoreline and beaches of Eastern Long Island, provide major sources of tourists and recreationists. Each year over 22 million people travel to state parks on Long Island to sun themselves, camp, picnic, and enjoy the ambiance of coastal living.<sup>3</sup> About 1.3 million sports fishermen use the coast to catch bluefish, flounder, cod, scup, tautog, striped bass and other species.<sup>4</sup> The area has the largest concentration of motorboat registrations in the State with Suffolk County having 58,992 registered boats and Nassau County 31,175.<sup>5</sup>

Lake Erie, Lake Ontario, and the three major rivers--the St. Lawrence, the Niagara and the Hudson--offer residents and visitors a freshwater environment. The Thousand Islands and Niagara Falls are the best known tourist areas, however, with the introduction of salmon and trout into Lake Ontario and Lake Erie more visitors are discovering the Great Lakes. Projections for Western Lake Ontario, for example, suggest that anglers for salmon and trout may account for 360,000 recreation days by 1985.<sup>6</sup> This new salmonid fishery is also reawakening interest in the indigenous fishery both in the Lakes and Rivers. New York State residents, however, have always known of the recreational opportunity along these shores and have taken advantage of the beaches, the winds for sailing, and water to play in.

Both the public and private sector provide areas, facilities, and services to coastal recreationists. The public sector provides parks, public access sites, historic sites, and a host of services such as the stocking of fish and the

marking of navigation channels. In Jefferson County, for example, the State provides 13 parks and 3 historic sites to help recreationists gain access to water.<sup>7</sup> The private sector provides commercial recreation enterprises such as marinas, horse stables, theme parks, hospitality businesses such as resorts, motels, and restaurants, and support services such as bait and tackle shops, souvenir shops, and retail stores. In support of boaters, for example, the State's private sector in 1979 supplied 432 boat liveries, marinas, and yacht businesses which employed 2,608 with a payroll of 39.7 million dollars and 282 boat and marine dealers/suppliers which employed 1,399 with a payroll of 14.5 million dollars.<sup>8</sup>

Visitors to the coast, that is, people who travel more than a hundred miles from home and stay overnight, have created a major tourism industry and have contributed to the demand for coastal recreation opportunities. Lodging receipts, which represent between 11-14% of a total trip's spending,<sup>9</sup> for New York State in 1972 accounted for \$918,203,000 of which New York City receipts represented 70% of the total.<sup>10</sup> Lodging receipts for some of the more important coastal counties in 1972 were: Suffolk - \$18,253,000; Nassau - \$25,431,000; Westchester - \$20,677,000; Rockland - \$10,466,000; Chautaugua - \$6,312,000; Niagara - \$10,630,000; Oswego - \$1,755,000; Jefferson - \$5,712,000; and St. Lawrence - \$4,673,000.<sup>11</sup> Reasons for visitation were many. Thousands traveled exclusively to engage in recreation. However many traveled to visit friends and relatives, engage in business, and/or attend meetings and conventions. Visitors to New York State coastal destinations, other than New York City, usually came from New York, Canada, or an adjoining state such as Pennsylvania.<sup>12</sup> Generally they travel by car (80%),<sup>13</sup> spend 3.4 days,<sup>14</sup> and spend \$30 per day per person.<sup>15</sup>

#### Concerns and Opportunities

Tourism and coastal recreation plans have not as a rule been developed for regions, counties, or communities. With plans which utilize information from the New York Statewide Comprehensive Recreation Plan and the State Coastal Management Program as a framework for action, a more coordinated strategy for tourism and recreation development can occur. Otherwise public access to coastal recreation resources by visitors and residents may become limited, coastal user conflicts may occur, important resources, both natural and man-made, could be compromised unnecessarily, and unwise decisions as to the type, amount and location of tourist and recreation areas, facilities, and services to provide could occur.

The viability of tourism and coastal recreation is dependent upon how well the resource base, both natural and man-made, is managed. Managing the resource base to ensure that tourism and coastal recreation thrive requires competency, authority and commitment.

Coastal tourism destination areas spend thousands of dollars each year to entice visitation away from competing areas and to ensure that visitors who come enjoy their stay.

Chambers of Commerce, Convention and Visitors Bureaus and Tourism Councils and Associations face the difficult task of managing, marketing, and promoting coastal tourism and doing so in a way which is competitive and cost effective.



Coastal recreation opportunities are very abundant. However, for visitors and residents to engage in the activities they must be aware of those opportunities and know how, when, and where to participate. Visitors and residents also need to know the costs associated with the activity, the safety measures which are required, and the characteristics of the coastal resources which they will be using.

#### Objectives and Approach

##### \*Planning for Tourism and Coastal Recreation

To have 15 communities and 5 counties review their tourism and coastal recreation assets and liabilities, assess future prospects, and make a conscious decision on whether to proceed with tourism and coastal recreation development or not.

The aim of Sea Grant activities is to help county/community decision makers understand the reasons why tourism and coastal recreation assets and liabilities need to be reviewed. Once a decision is made, assistance is given to begin the planning process, provide the tools which will help analyze their assets and liabilities, assess future prospects, and weigh alternative courses of action. The emerging sport fishery, the lack of public access, economic development, and waterfront decay are some of the issues around which programming will evolve.

##### \*Managing Coastal Resources for Tourism and Recreation

To have 20 resource management groups such as Fishery Advisory Boards, and Environmental Management Councils, and 3000 coastal land owners, public and private, identify existing and potential coastal resource issues which affect tourism and coastal recreation and develop a strategy on how to address the issue.

Sea Grant should help equip resource managers or those concerned with resource management with information on the principles of coastal resource management, and train them in public participation and coastal resource management techniques. Aquatic plants, fish contaminants, oil spills, artificial reefs, and fishing pressure are some of the issues which need to be addressed specifically. The carrying capacity of tourism and recreation areas and the potential impact of new coastal development options (e.g. second home development, gas drilling in Lake Erie, upgrading the size of ships on the Seaway) also are worthy of attention.

##### \*Managing, Marketing, and Promoting Coastal Tourism Destination Areas

To have 10 county and 50 community tourism organizations begin to develop a tourism management strategy for their area and adopt 5 proven tourism marketing and promotion techniques.

Extension program activities should be aimed at showing tourism organizations how other coastal tourism destination areas are managed, explain marketing and promotion techniques and show how they can be adapted in New York. Example program areas which could be emphasized include the use of trails, vacation packaging and tourism marketing systems.

##### \*Visitor and Resident Coastal Recreation Information and Education

To have 40,000 residents and 30,000 coastal visitors receive coastal recreation information on where and when opportunities exist and how to partake of those opportunities safely.

To have 5,000 youth and 1,000 employees in the tourism industry taught hospitality related skills.

Sea Grant should train leisure service providers such as Chambers of Commerce and Park and Recreation Departments on how to increase coastal recreation participation via programming and facility development. Direct programming to potential recreationists via publications, articles, and programs also will be included. In addition Sea Grant should train 4-H leaders and other trainers of youth how to teach hospitality related skills.

#### References

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8. Division of Economic Research, New York State Department of Commerce, "Tourism and Recreation Business - Number of Reporting Units, Employment and Payroll New York State, 1979," Travel and Tourism in New York State. (xeroxed) p.4.
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13. Charles R. Goeldner and Karen P. Dicke, Travel Trends in the U.S. and Canada - 1978 Edition (Boulder, Colorado: Business Research Division - University of Colorado, 1978). p. 79.
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## COASTAL TOURISM AND RECREATION BUSINESS DEVELOPMENT

### Background

Coastal tourism businesses are located in all major coastal areas in New York State. For the 550,000 pleasure craft in New York State in 1972, approximately 1,500 waterfront facilities existed to support requisite services. These facilities included marinas, charter boats, theme parks, boat launching sites, gas docks, boat rentals, boat sales, boat repair yards, bait and tackle shops, motels, gift shops, camps, cottages and restaurants. Boating is only one component of a varied state tourism industry that includes sightseeing, bathing, fishing, camping and other recreational activities. These businesses annually contribute billions in revenue in New York State.

Trade associations are important vehicles for upgrading skills of participating businesses and opening new avenues of business profit. In boat sales and marina businesses there are currently seven major autonomous trade associations with a combined membership of about 400 businesses. These associations offer varied programs for educational, insurance or other purposes.

Coastal tourism businesses are unique in many of the kinds of recreation they offer--boating, fishing, bathing--as well as high costs of doing business on waterfronts. Higher costs result from additional government regulation and from greater environmental stresses on waterfront properties, especially erosion.

### Problems

To effectively address the needs of the industry, or segments of it, there is a need for organization. Some of the best learning comes from practical information shared among businessmen. Also, businesses need to group together to achieve credibility in seeking responsive government posture, cut business costs and achieve other important recognitions. However, few businessmen can afford the time to research organizational forms and mobilize interest.

Coastal tourism businesses have a very critical business cycle. For many businesses the major season is only two months long: from the 4th of July to Labor Day. Some businesses may enjoy a longer season--up to 4 months for marinas and somewhat longer for sport fisheries. This characteristic necessitates a highly efficient business effort for concentrated earnings during a short business season to carry the enterprise successfully through the dormant winter months.

### Approaches

Business needs in response to the split season are diverse. During active months, maximizing profits requires a well trained staff and smoothly functioning business procedures. During off months, cost saving techniques are critical to survival. The business management component of programs should bring businessmen information on financial management, including financial ratio, market and product analysis. Also, the financial implications of ownership alternatives such as fee simple leasing and co-operative arrangements, are often poorly understood and require explanation. Data processing and human resource management are important topics for many businesses. New data processing techniques enable more efficient recording and extrapolation of business data, but have implications for necessary support staff skills.

Business development needs should focus programs on training in market analysis, economic development planning and forecasting economic development impacts. Information on how to best carry out a project is critical. Where to go for permits, whom to contact, where to look for human or financial resources, how to schedule work and how to prepare reports are common needs.

Organizational development programs should involve leadership training to develop the abilities of tourism businessmen to successfully organize and lead a trade association. This training should include programs to help leaders set goals. It should also include procedural and legal guidelines as well as exposure to examples of both successful and unsuccessful endeavors of similar organizations.

For established trade associations many benefits can be realized by networking with other groups with similar interests. This can cut duplicative efforts. For instance, a workers' compensation insurance package developed by one group may be adopted by another, saving costly time investment in researching and establishing a separate program. Efforts should be focused here on identifying the appropriate linkages and facilitating their establishment.

Planning for business information needs of individual trade associations is a common need of leaders. Here, focus should be on identifying educational programs and assisting in implementing them.

#### Objectives

- Have a healthy and growing tourism business in New York State.
- Have tourism business managers well versed in financial management skills, relative advantages of ownership alternatives, and new data processing techniques.
- Have well planned business development supporting an expanding tourism business.
- Have well organized and run trade associations meeting the educational and business needs of individual members.
- Have good networking among trade associations to maximize efficiency in responding to marine business needs.

#### References

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## ENHANCING COASTAL TOURISM FACILITIES

### Background

The leisure industry has grown at an increasing rate to become one of the largest dollar volume industries in the country. In New York State, there were 3,174 businesses in 1973 specifically providing facilities to service marine recreation needs.<sup>1</sup> This industry is composed of boat building and repair enterprises; marinas, boatyards; mooring enterprises; yacht clubs; and, marine supply dealers. These businesses serve an estimated 4,000,000 New York boaters<sup>2</sup> and 2,000,000 sport anglers<sup>3</sup> each year. More than 1,500 public marine facilities<sup>4</sup> are operated by the state, counties, towns and municipalities. These public initiatives provide coastal parks; swimming beaches; docking and navigational aids for boaters; as well as facilities to improve fishing and boating access.

Private and publicly owned marine recreation facilities in this state confront similar challenges from the economy, environment and government regulators. The economic downturn and diminishing government financial support for marine facilities are reducing expansion and improvement of these. This, despite the expectation that boating related recreation will increase by 28.2% by the year 2,000.<sup>5</sup> Typically, both public and private marine recreation facilities are being asked to do "more with less" despite rising costs. This reflection of nationwide trends suggests that new approaches are needed to raise facility effectiveness and efficiency. Without improved practices, marine facilities will not meet public needs, and industry profits will be constrained.

### Problems

Managers of marine recreation facilities need reliable decision making information on ways to reduce operating costs; economically improve client services; and, maintain safe facilities in a cost efficient manner. Specific long-term challenges include:

- Local governments and private operators need to learn of less expensive options for developing facilities;
- Erosion of beach and bluff areas causing expensive damages;
- Wave and ice damages, siltation and corrosion reducing the useable life of marine facilities;
- Lack of design information for effectively developing boat launch ramps, parking areas, floating dockage, fuel and electrical systems, storage facilities, lower cost moorings and appropriate landscaping;
- Improving signing and other exterior business promotion techniques, with display/sales areas inefficiently used;
- Improving customer service techniques related to equipment maintenance and energy conservation;
- Regulatory agencies and zoning boards are limiting recreation facility expansion and improvements;
- For lack of long-term facilities planning, creative alternate resource uses are not being identified by managers;
- Government and private industry representatives often overlook collaboration to manage or develop recreational access;
- Facility developers/operators need to learn appropriate facility maintenance procedures.

### Approach

Educational initiatives to enhance coastal recreation facilities should emphasize:

- Encouraging the development of new facilities and efficient maintenance of existing operations. Educational projects might focus upon site analysis, facility and equipment alternatives, funding sources and alternate management improvements;
- Ways for managers to reduce overhead costs;
- Options for facility managers to cope with damages caused by natural processes;
- Ways for facility managers to physically improve business promotion, client services and energy management;
- Long-Term planning techniques for facility layout and improvement;
- Opportunities for government and private industry to collaborate on facility development or management, when appropriate;
- Opportunities for developers/operators to learn appropriate facility development/maintenance procedures.

### Objectives

- Have existing and potential marine facility operators evaluate alternate financing and facility design alternatives;
- Stimulate community groups, businesses and public officials to cooperatively assess, plan and, when appropriate, finance coastal recreation facilities;
- To have community groups and public officials aware of alternate state and federal financial assistance available for developing waterfront recreation facilities;
- Have coastal communities, businesses and public agencies evaluate access needs and possibilities for collaboration between public and private entities;
- To assist community planners to maximize coastal recreation facilities while minimizing attendant difficulties from this;
- Have planners and developers recognize recreation access as a major revenue generating coastal waterfront development;
- Have landowners and recreationists collaborate to minimize conflicts resulting from access to coastal waters;
- Have developers build better designed sited and constructed facilities.
- Have existing facilities better maintained.

### References

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3. National Marine Fisheries Service, 1979.
4. NYS Office of Parks and Recreation, 1982.
5. People, Resources, Recreation: The New York Statewide Comprehensive Recreation Plan. (State Office of Parks and Recreation: Albany, NY, 1978).



## COMMERCIAL FISHING INDUSTRY

### Background

Fish landed by New York's commercial fleet were worth \$49 million dockside in 1982. As in previous years, the hard clam Mercenaria mercenaria was New York's most valuable fishery resource in terms of landed value of product (\$15 million), employment (6000 full-time and part-time), and pounds landed (13% of total).

An estimated 7,500 full and part-time individuals participate in the harvesting sector of New York's commercial fishing industry, down from about 9,000 in recent years. This decrease is attributed primarily to attrition from the hard clam fishery.

Since the 1977 implementation of the Fishery Conservation and Management Act, the finfishery has experienced impressive growth. Documented commercial fishing vessels in New York increased from approximately 135 in 1976 to over 200 vessels in 1979. The shellfish and finfishing fleets are primarily owner-operated businesses. Individual fishermen lack the capital, technology, research capability and time, to fully assimilate changes in technology, marketing conditions and government management decisions. Fishermen typically harvest a publicly-owned resource, one they have no control over. Thus they are faced with regulations by those "owning" the resource, i.e., town government in the case of most shellfish, state government for fish within three miles of New York's shoreline, the Federal government beyond that point to the 200-mile limit.

New York's Lake Erie harvest was valued at only \$190,000 in 1982. Employment is probably less than 30 persons at peak season with about 12 licensed commercial operators, 6 of whom operate tugs. Gear restrictions and perceived conflicts with recreational fisheries make the future of commercial fishing in New York waters of Lake Erie highly uncertain.

### Problems

**Finfishery:** Lack of market development for underutilized species has resulted in expanded efforts on traditional fish stocks resulting in depressed dockside prices for those finfish. This, coupled with increasing operating expenses has left fishermen in a cost-price squeeze.

Increasing use of coastal water resources by various user groups has resulted in conflicts in the form of rope fouled propellers, vandalized and damaged equipment, and minor injury. These problems are largely due to incorrectly deployed fishing gear, or misrecognition of that which is correctly set.

Regulations governing the finfishery in state and federal waters change rapidly. The result is poor understanding by the fishing community.

High cost of fuel and maintenance on large trawlers continues to decrease profits in fishing operations.

Discontinuation of free medical care programs for fishermen have resulted in a lack of knowledge of alternative health and medical insurance programs.

Lack of local finfish processing capabilities ties local harvesters to the fresh fish market.

Shellfishery: Declining standing stocks and increasing operating costs have resulted in economic hardship for shellfishermen in New York State.

Increasing pressure from various other user groups threatens to damage the marine environment and/or restrict or eliminate shellfishing operations.

#### Approach and Objectives

Through the educational techniques of workshops, demonstration projects, literature development, and personal contacts it is planned to:

- stimulate industry growth and stabilization by education about opportunities and techniques to harvest, process and market underutilized fishery resources;
- reduce operating and maintenance expenses by introduction of fuel efficient gear and operating techniques;
- make fishermen aware of the alternative health and medical plans available;
- reduce that portion of conflict with other user groups that is the result of misinformation and incorrect perception of the facts in hand;
- make fishermen aware of legislation and regulations that affect their livelihoods;
- help local, county, state and federal government entities more effectively administer and develop marine resources.

## SEAFOOD MARKETING

### Background

The paths followed by the estimated 500,000 metric tons of fish and shellfish marketed through the Greater New York Region annually are as varied and diverse as the numerous products which flow from them.<sup>1</sup> In 1981, 45,000,000 pounds of fish and shellfish landed by New York fishermen contributed to the New York market. Most of this product was immediately sold to the fresh retail trade or consigned to the wholesale market for distribution. The marketing channels used by New York fishermen primarily provide product to meet the demands of the fresh seafood market. New York seafood harvest which is not sold for fresh seafood markets is either processed for other domestic markets or exported. Both foreign and domestic seafood imports are very important sources for the New York market. In 1980, about two-thirds of the U.S. supply of edible fishery products was imported.

In 1982, per capita consumption of seafood was 12.3 pounds as compared with about 150 pounds from meat and 57 pounds from poultry. Seafood purchased for home consumption represents less than half of the total market. An estimated 60 percent of seafood consumed in New York is sold in restaurants and institutional offerings.<sup>2</sup>

### Problem

Fresh seafood products are highly perishable. Without processing, harvests must be sold as landed regardless of market supply and price. Exclusive continued reliance on the fresh seafood market by New York fishermen results in low prices during peak seasonal production periods.

Overall domestic seafood demand is expected to expand because of dietary and taste preferences; but, is presently low when compared to demand for other meat products. Since seafood demand has been found to be relatively insensitive to price changes, it appears that greater consumption will result from creating changes in attitudes and perceptions of seafoods, which to a great extent will require broad-based, long-term educational and promotional effort.

Export demand for U.S. harvested, undermarketed species has grown slightly with the extension of fisheries jurisdiction to 200 miles. However, it is apparent that the expected growth relative to the estimated annual resource availability which, for the East Coast is 486,000 (maximum sustainable yield) metric tons,<sup>3</sup> will depend on eliminating barriers which include: import duties, various foreign trade strategies, lack of consistent harvesting efforts, processing facilities, the establishment of proper handling procedures and quality standards.

Supply of a given species in quantity, seasonally and year-to-year, is difficult to control because of biological, environmental and fishery management factors coupled with the fragmented and independent nature of the harvesting sector of the industry.

The relative lack of mass marketing of domestically harvested fish through supermarkets and fast-food outlets is perhaps the single most important problem and at the same time represents the greatest opportunity for future growth.

### Approaches

Educational activities to enhance seafood marketing should:

- Stimulate and facilitate educational programs for commercial fishermen, seafood processors, wholesalers and retailers that can broaden their views on marketing alternatives and strategy.
- Initiate and coordinate agency efforts with seafood industries, state agencies, local government and regional fisheries development foundations that provide the necessary linkages for growth and development of New York's fishing industry to expanding seafood markets.
- Program and coordinate the development of innovative seafood marketing educational programs that aid seafood harvesters, processors, wholesalers and retailers to channel their products to consumers.
- Identify educational and research needs of seafood industry, counties, region and state communicating recommendations to Sea Grant Institute, Cooperative Extension, SUNY/Cornell University Seafood Technical program and fishery development foundations.
- Assist existing seafood industry in identifying seafood marketing problems, setting objectives and outlining plans of action.

### Objectives

Have fishermen, processors, wholesalers and retailers understand and adopt quality standards that ensure that products meet market acceptance.

Facilitate further penetration of existing export markets and development of new markets for traditional and undermarketed fishery products.

Have harvesters evaluate feasibility of various methods of forward integration to achieve greater marketing ability.

Coordinate and improve information availability on supply and demand conditions, competitive markets and market access.

Have domestically harvested seafood markets increased through expansion of supermarket and other broad-based institutional distribution methods.

Have "Caught in New York" label be utilized in marketing at least two New York State harvested fishery products.

### References

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3. Earl R. Combs, Inc. Fishery Issue Consultants. (1979).

## SEAFOOD TECHNOLOGY

### Background

The seafood industry is an important economic enterprise in New York State. Over 180 million pounds of fresh and frozen seafood are handled annually in the Fulton Fish Market.<sup>1</sup> The annual retail value of the New York fish trade is estimated to be over one billion dollars.<sup>2</sup>

Filleting or cutting of fish is a major activity of New York City finfish processors. The shucking and packaging of shellfish products such as bay and sea scallops, surf clams, hard clams, oysters, squid, conch and crab takes place primarily on Long Island in close proximity to the resource. These seafood processors are typically modest in size reflecting closely held corporations or sole proprietorships.

Present export and domestic market opportunities necessitate significant changes in the processing sector if New York is to realize expanded economic benefit from its fisheries. Cornell University's nationally recognized seafood program is conducting a broad spectrum of research including development of new products from minced, deboned fish; extending the shelf life and quality of fish; recovery of previously wasted protein and flavor materials with that incorporated into new products; and basic nutritional studies of seafoods. Related research and development activities have advanced seafood waste treatment, the production of fish meal and oil; and improved energy utilization in seafood processing.

### Problem

The majority of seafood processing plants in New York State are not adaptable to a developing fishery. The relatively antiquated methods of many packers and processors do little to encourage the hope of fishermen who expect to receive a reasonable and stable price for fresh fish in quality condition. While processors in other areas are taking advantage of opportunities created by extended jurisdiction, New York State is still oriented to a fresh fish market.

Seafood businesses in this state are not readily adopting cost-saving technology and techniques to extend shelf life and improve seafood quality. For lack of careful energy management in seafood processing and use of emerging computer technology many businesses operate on the margin. Additionally, few innovations in the marketing of seafoods by supermarket enterprise are being undertaken. This is especially true of poorly marketed species including squid, whiting, hake and others.

### Approach

Educational initiatives to enhance seafood technology should:

Stimulate and initiate educational programs for seafood processors and retailers on the effects of handling on product quality.

Stimulate and initiate multi-agency efforts with other Sea Grant programs, the National Marine Fisheries Service Seafood Laboratory at Gloucester, Massachusetts and university faculty to expand mutually beneficial research and educational initiatives to benefit the seafood handling and processing industry.



Provide expert advice and consultation in this subject area to seafood processing businesses, Cooperative Extension specialists and agents conducting educational programs, community and governmental leaders and private individuals.

Identify educational and research needs of counties, region and state; communicating recommendations to Sea Grant Institute, Cooperative Extension and the SUNY/Cornell University Seafood Technology Program.

Have a Seafood Technology Program Advisory Committee evaluate educational programming in the areas of shelf life extension; seafood handling techniques; energy management alternatives in processing; computer applications for the seafood industry; recovery and utilization of seafood processing wastes; and improving the quality of seafood handling and storage by supermarkets, seafood markets, restaurants, harvesters, and distributors.

Work with the National Marine Fisheries Service Seafood Laboratory at Gloucester and university faculty, identify innovative seafood processing and handling equipment which would be of interest and value to the industry. Make industry members aware of emerging innovative technologies and stimulate their conscious evaluations and decisions on the use of this equipment in their business.

#### Objectives

Stimulate use of more efficient seafood processing equipment by packers and processors.

Have processors and packers begin to market underutilized species of fish, minced fish and minced fish products.

Have wholesalers, processors and financial interests in New York City and on Long Island become aware of the potential for increased processing of fish and squid as a result of extended jurisdiction.

Participate in the establishment of a seafood laboratory and develop educational programming using the facility as a regional demonstration and training tool.

Enable operators of fresh fish markets to use current information on effective seafood display and preservation techniques.

Aid supermarket managers in assessing the value of and alternatives for increased marketing of seafoods.

Have commercial fishermen improve seafood quality by using better onboard vessel seafood handling techniques.

Have seafood processors, retailers and distributors become informed about shelf-life extension methods for maintaining quality throughout distribution.

#### References

1. Receipts of Seafoods of NYC Fulton Fish Market, 1978, National Marine Fisheries Service Market News Branch, New York.
2. Fisheries Development Opportunities for New York, Westgate & Associates, 1980.

## CONSUMER USE OF SEAFOODS

### Background

In 1982 approximately 2.83 billion pounds of seafood were consumed in this country. This figure is derived from the 12.3 pounds national consumption rate per capita. Since 1970, consumption has increased 8% at the same time that prices increased 26%. One reason for the increased consumption of seafoods is the increased awareness of the effect of diet on health and an overall change in eating habits toward more nutritious foods. A study by Texas A&M indicated that 90% of the population views seafoods as an extremely nutritious food commodity and an important part of a healthful diet.

A more detailed study of national demographics showed that another reason for increased fish consumption was an increase in those segments of the population concerned about eating nutritious foods. These nutrition conscious populations include singles, children between 12 and 18, and couples over 40 with no children. In 1970 60% of the population fell into these stages. In 1980, these categories accounted for 70% of the population. As these population segments increase consumption of seafood can also be expected to increase.

The breakdown of what constitutes the 12.3 per capita seafood consumption is 7.7 pounds of fresh and frozen seafoods which includes 2.7 pounds of fillets and steaks and 1.7 pounds of sticks and portions, 4.3 pounds of canned seafoods including 2.7 pounds of tuna, and 0.3 pounds of cured seafoods.

A study by the National Marine Fisheries Service in 1981 showed that 4.5 pounds of edible seafoods is purchased per capita from retail outlets such as supermarkets and fish markets. This represents 37% of the 12.3 pounds per capita consumption. This consumer/retailer interface is an opportunity for consumer seafood information intervention.

The Greater New York/New Jersey Metropolitan area with some 15 million residents and 17 million visitors spends an estimated 1.5 billion dollars for seafood eaten at home and in restaurants. Although it is not accurately known what the average household expenditure for seafood is in this area, a recent study indicated a figure of approximately \$120 per year which is twice the national average. Much of the seafood consumed is either canned tuna and shrimp, processed convenience foods, frozen breaded products or higher value white flesh species such as cod and flounder or shellfish such as shrimp, clams and lobsters.

Because market demand is so high for select species, they have become more costly. At the same time there are numerous untapped edible species which have not been discovered by the American consumer. Cornell food scientists with support from Sea Grant and others have been seeking low cost alternatives, such as convenience food from underutilized species. In addition, Sea Grant sponsored seafood nutritionists and extension specialists have been developing and disseminating information that can help consumers become aware of the wide variety of seafood that is available.

Consumption studies have indicated that over 60% of seafood consumed is purchased at restaurants. To overcome consumer prejudice about using seafood at home, Sea Grant specialists have designed programs targeted at consumer educators. New York State has over 2700 teachers of home economics, 180 Cooperative Extension home economists,

472 nutrition paraprofessionals, plus countless other consumer educators as well as 30,000 retail outlets for seafood.

#### Problem

Home consumption of seafood equals less than half of the total regional market, with 60% of all seafood consumed in restaurants. Studies by Texas A&M and the Food Marketing Institute indicate that consumers are reluctant to cook seafood at home because they feel that they lack experience in purchasing, handling and preparing it. In addition, they feel that it is inconvenient. In addition, consumers feel uncertain about the duration of the present economic recovery and are still conserving resources. Disposable income items such as dining out is one area in which economically constrained families can save. This in turn will decrease seafood sales unless an effort is undertaken to make consumers feel more comfortable with this food commodity in the home.

Two opportunities exist for improving use of seafood at home. Due to the increase in multi-earner households, use of traditional species by population segments who can afford to pay premium prices is one opportunity. Lack of confidence in making product selections, lack of familiarity with handling, storing and preparing seafoods are still barriers to this potential market.

In addition, the use of less expensive nontraditional species by economically constrained audiences is another route. Barriers such as lack of consistent supply, quality, unappetizing names, lack of instructions and poor appearance hinder the expansion of this market.

Consumer perceptions of quality are based on both good and bad experiences with seafoods. Because of uneven handling procedures by harvesters and lack of consistent inspection procedures, overall quality standards do not exist. Evidence of this dilemma exists as the quality of domestic seafood has been identified as the single-most important deterrent to export market development. Primary responsibility for product quality rests with the harvester. Without proper onboard handling practices, high-quality seafood is virtually impossible to attain. Quality can only be maintained, it cannot be improved.

#### Approach

The key to continued seafood consumption is a continuum approach that is directed at all links from harvester to consumer. This would include all of the middlemen such as packers, processors, wholesalers, and retailers. Handling and quality maintenance information directed at each link in the seafood distribution chain is needed. The Seafood Technology program addresses the producer/distributor links.

Continued research directed at developing products using less marketed species and processing by-products is equally important. To gain consumer acceptance, educational efforts are required.

The keys to widespread consumer awareness are targeted educational materials and programs directed toward food and nutrition educators, media professionals and consumers. Supermarket personnel and restaurateurs who interact with consumers are other audiences in need of accurate information to pass on to customers.

### Objectives

- Have food and nutrition professionals become informed about seafood availability, quality, marketing, identification, safety, utilization, and nutritive value so that effective outreach programs can be undertaken both at the state and county levels.
- Have supermarket seafood and meat managers become informed about shelf-life, species identification, and basic handling and preparation methods in order to answer consumer questions.
- Have restaurant owners and other institutional users become aware of proper methods of handling and preparing seafood.
- Have consumers become knowledgeable and skillful in purchasing, handling and preparing seafood.
- Have consumers become aware of the benefit of seafood in the American diet.
- Have consumers become informed of new foods resulting from innovative processing procedures for less marketed species and use of byproducts.
- Have freshwater sportfishermen recognize and understand the potential health hazards of consuming certain fish from contaminated waters and use appropriate preparation techniques.

## YOUTH EDUCATION

### Background

Numbering more than 3.8 million individuals in New York coastal cities and counties and representing 20% of the State's total population, youth aged 5 to 19 represent an important coastal audience--and resource! This statement differs from all others in our plan by focusing on that particular audience rather than a subject area. Youth are a significant coastal user group. On the order of 20% of youth aged 5 to 19 fish, 80% swim and 30% boat, many of them using coastal waters. Many youth groups or school systems either have facilities or conduct activities on the coasts.

In addition to their role as coastal area users, our efforts with youth have another basis. Borrowing a theme from the origins of 4-H agriculture programs, youth programs can be a means for influencing adult decisionmakers--both through contacts with parents and as today's coastally conscious youth become tomorrow's informed coastal decision makers. In other words, involving youth represents our investment in the future of coastal resources as well as our commitment to a current coastal user group.

There are more than 460 public school districts in New York's coastal areas. More than one-half million youth participate in Cooperative Extension 4-H programs statewide and there are more than 4,000 other recreation or education oriented youth groups. It is clear that any serious attempt to reach a significant portion of youth must be firmly based in a "teach the teachers" or "multiplier" mode.

In addition to direct education about coastal topics, our efforts with youth should have the additional benefit of providing fresh subject matter and educational activities for school children. Since the statewide school dropout rate still averages more than 30% before completion of high school, any such contribution could be important. Also, since our youth program is concentrated in urban areas, it represents a primary means for reaching out to the 2 million minority group members in coastal urban areas.

### Problems

In many cases, technical subject areas require additional translation and packaging for use with youth audiences than when used with adult audiences. Sea Grant educational research and extension activities in recent years have generated a strong core of materials and experiences. The task now is to ensure effective distribution and utilization of such resources. Innovative approaches must be developed to gain adoption in education systems and youth organizations. Dramatically increased involvement of other organizations in coastal education for youth is required.

### Approach

All youth programs should be firmly based in the technical competencies of Sea Grant. There are numerous other organizations which conduct natural resource oriented educational programs. Our unique attribute is coastal expertise. To the extent possible, programs will be framed to include meaningful involvement in real coastal problems to develop decision-making capabilities. The role of youth as coastal recreationists serves as a mechanism for introducing them to coastal issues. For example, coastal recreation safety programs can easily include sportfisheries development considerations and shoreline use conflicts. School systems and 4-H programs are primary channels for our efforts.



Objectives for 1982-1985

Have "packaged" coastal community action programs for youth replicated in at least fifteen coastal counties involving at least 7,500 youth.

Have recognizable coastal education components in the 4-H programs of 20 coastal counties.

Have other specialists produce at least four project components for use in 4-H.

Have recognizable coastal education components in 100 school systems in coastal counties.

Have 125 youth organizations conduct coastal education activities.

Have 10% of 4-H youth using a seafood selection computer program.

NEW YORK SEA GRANT EXTENSION PROGRAM

LOOKING TOWARD 1990

Introduction

This document serves as a discussion base for deliberate decisions on the relationships between Sea Grant and other Cornell Cooperative Extension programs over the next several years. It is not prescriptive in the sense that all opportunities or changes identified are hard and fast organizational goals. Current thinking only can be reflected. If this truly is a working document that thinking can and will change. However, several underlying needs will shape specific decisions. These include:

1. Need for increased county association participation in the Sea Grant Extension program.
2. Need to develop additional campus backstopping in several technical areas.
3. Need for creative mechanisms to extend Sea Grant subject matter and expertise that apply statewide, that is, outside the defined coastal jurisdiction of Sea Grant.

In today's world, budget is a major influence on the scope and nature of program. The options identified assume little or no real growth in Federal support for Sea Grant Extension programs over the next several years. Any significant departure from that scenario will allow, or require, rethinking of the options identified.

Intended audiences for this document are Office of Director, Cornell Program Teams, Extension Advisory Council, Sea Grant Program Advisory Committees and county staff and lay leadership as appropriate.

It was developed by the following persons.

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## Executive Summary

Looking Towards 1990 is a discussion document dealing with relationships between Sea Grant and other Cornell Cooperative Extension programs over the time period 1983-1986. It is divided into three parts--an historical overview, plans for specialist positions and hopes for county-based programming. Key observations from each section follow.

### I. The Sea Grant/Cooperative Extension Partnership--An Historical Perspective

The history of the Sea Grant Extension Program as part of Cornell Cooperative Extension is traced from the 1971 first year award to the present. Specific decisions or accomplishments that resulted in integration of Sea Grant and other Cornell Cooperative Extension programs are listed.

### II. The Sea Grant Specialist Network

The current geographic and subject matter distribution of Sea Grant funded regional staff and campus positions in Sea Grant related subjects are described.

Emerging campus support needs are identified in marine recreation, business management, coastal issues and aquaculture. Youth education and water resource management issues were identified as statewide topics that hold potential for collaborative funding between Sea Grant and other Extension units.

Great Lakes regional programs undergoing most change were identified as sportfisheries development and youth education. One sportfishery related position will be eliminated by 1984 resulting in need to reassess office locations and subject matter assignments. In youth education, a Youth Involvement in Coastal Issues small grant program is being initiated to encourage increased county programming.

Marine District regional programs undergoing most change were identified as coastal protection, marine tourism and Hudson River programming. In coastal protection, the existing erosion specialist position is being redirected in part to serve marine facility and port planning education needs. If feasible, a marine tourism specialist position will be established by 1984 as will a Central Hudson River position.

### III. County Based Programming

The network of Sea Grant specialists is insufficient to address specific needs of coastal clientele in all coastal counties and to address statewide topics such as seafood safety and nutrition or tourism development. The historical involvement of each coastal county in Sea Grant related programming is reviewed and possible areas of collaboration identified. Specific Sea Grant goals for county programming are listed by county and region.



## Part I The Sea Grant/Cooperative Extension Partnership--An Historical Perspective

Sea Grant was born in an Act of Congress in 1966. The objective was to establish and develop Sea Grant colleges to assist the states and nation in use and conservation of the natural resources of our Great Lakes and oceans. Activities mandated by the Act are training, research and advisory services.

This brief history reviews how New York Sea Grant evolved from that Act of Congress. Our purpose is to establish background understanding for discussion of future Sea Grant Extension Program trends in New York, especially as they interface with programs of Cornell Cooperative Extension.

### Sea Grant in New York -- The Early Days

The State University of New York (SUNY) and Cornell University initiated their Sea Grant program in the spring of 1969 with a planning grant. The concept of a multi-campus Sea Grant had been suggested by Cornell University administration in 1967. The first formal proposal for such an arrangement was submitted in April 1970 with the first year funding awarded in October 1971. Lead responsibility for the development of the New York Sea Grant Program was assigned to the Director, Marine Sciences Research Center, State University of New York, Stony Brook. In the second year, administration of the program was relocated from the Marine Sciences Center to Albany to emphasize the multiple-campus nature of the program. In October 1974, the U.S. Department of Commerce Secretary designated State University of New York and Cornell University the eighth Sea Grant College.

At that time the trustees of SUNY and Cornell authorized by resolution the formation of the Sea Grant Institute as a cooperative activity. The Institute is considered a "campus" by SUNY, to which the Institute relates for administrative services.

Policies and practices of the Institute are established by a Board of Governors. Membership consists of equal numbers of appointees by the President of Cornell and the Chancellor of SUNY as follows:

- Ten senior university administrators
- Two "at large" citizen members
- As ex officio members: the Commissioner of Environmental Conservation, Commissioner of Commerce and Director of the Institute.

### Differences from Land Grant

Cornell University is the Land Grant University for New York and is responsible for all related activities in research, teaching and extension. The statutory units at Cornell are part of the SUNY system. In contrast, SUNY and Cornell are equal partners in Sea Grant. That is, SUNY has an equal responsibility to that of Cornell for implementing the Sea Grant Program. The extension component of Sea Grant is administered through Cornell but research and education functions are carried out by Cornell, SUNY units and other universities in the State.



The Sea Grant Extension Program thus is the extension component of the New York Sea Grant Institute. Sea Grant Extension staff are responsible to the Institute for assuring that the Sea Grant mission is carried out and that Sea Grant funding is expended appropriately in so doing. As part of Cooperative Extension, Sea Grant staff also are responsible to Cornell to assure Extension's mission is complemented.

#### Funding Base

Federal Sea Grant funds originate in the U.S. Department of Commerce with the National Oceanic and Atmospheric Administration as the lead agency. The Act requires state and/or local matching dollars equaling 50% of the Federal award. In New York, this matching requirement has been met through contributed services, facilities, etc. of the two universities, direct state appropriations, and industry contributions. To date, funding from local government and Cooperative Extension has been modest. Federal Sea Grant funds are awarded competitively at the program level. There is no formula for distribution similar to that used for Smith-Lever appropriations.

The proportion of total Institute federal and state dollars allocated to the Sea Grant Extension Program is determined by the Board of Governors. Originally this was set at 25%--then the highest proportion of any Sea Grant program in the nation--now it is 33 1/3%.

#### Sea Grant Advisory Services Evolve Into the Sea Grant Extension Program

At the outset, Cornell Cooperative Extension and Sea Grant leadership determined that new approaches were required to establish a strong program in subjects for which there was little research backstopping. Specifically, a network of regional specialists was seen as necessary to establish technical expertise and effectively use the findings of Sea Grant research that would soon follow. While it was recognized that this approach might slow the direct involvement of counties in programming, it was thought that county based programming would follow--as appropriate--once a strong regional program was in place.

A program leader was identified and the New York Sea Grant Advisory Service (Advisory Service being the term in the original Sea Grant legislation) was established in 1971. Initially, it was administered through the Cornell Department of Natural Resources. Since that time, significant progress has been made both in establishing a strong Sea Grant program and in integrating Sea Grant and Cooperative Extension Programs. A few milestones follow.

Prior to 1977, collaborative programming with counties generally was on an ad hoc basis--although strongly encouraged by Extension and Sea Grant leadership. In that year and in 1978 a series of modest special project grants were made to counties on a matching basis to encourage development of programs supporting regional Sea Grant programs.

Also, by 1978, there were eight regional Sea Grant offices and about 20 staff statewide. Four offices were colocated with Cooperative Extension, while four were on SUNY campuses. Administration of the Sea Grant Extension Program was shifted from the Department of Natural Resources to Extension Administration and an Assistant Program Leader (now Program Coordinator) position established within extension. Extension Representatives assumed the same responsibilities



for Sea Grant staff as they had for other extension associates. The name of the program was changed to the New York Sea Grant Extension Program both to more accurately reflect its roles and to identify the link with Cornell Cooperative Extension. A second Program Coordinator position was established. Both Program Coordinators report to Office of the Director through the Assistant Director for Rural and Community Development Program.

In 1979, Suffolk County became the site of the first county position jointly funded by Sea Grant and that county's Extension Association.

In 1982, two regional extension positions jointly funded by Sea Grant and counties were established in the lower Hudson Valley and Nassau County.

The changes recounted above represent deliberate steps to integrate Sea Grant and established extension programs to their mutual benefit--a goal of program leaders from the outset.

### Challenges for the Future

While a program nationally recognized as highly effective has been established and strong ties to County programming are developing, it is not prudent to assume that present linkages and program strategies are optimal. The following questions require careful discussion as we plan for the next five years.

#### I. College Administration

##### A. Are changes in Sea Grant Extension Program Leadership and administrative structure needed?

- Evolving leadership roles.
- Responsibilities of Extension Administration for Sea Grant.
- Ties to Office of Director.
- Membership on Cornell Program Teams.
- Ties to Agent/Faculty committees, faculty, Sea Grant and other researchers.

##### B. Are changes needed in college responsibilities for Sea Grant extension associates, and perhaps other extension associates?

- Classification and salary administration.
- Professional improvement programs.
- Professional advancement opportunities, etc.
- Position support and funding mechanisms.

#### II. County Program A network of regional specialists funded by Sea Grant is in place. While effective for addressing primary regional needs, the Network is insufficient for meeting particular county needs.

##### A. In areas of concentrated educational need, what funding strategies are most appropriate and effective for establishing new positions and/or program support dollars?

- Seed money programs.
- Long term collaborative funding.
- Roles of Cornell Cooperative Extension.
- County funding, etc.



- B. *In situations that don't warrant new positions, how can Sea Grant expertise most appropriately be shared and local programs developed?*
- Inservice training.
  - "Loan" of Sea Grant staff.
  - Collaborative project funding, etc.
  - Media outreach activities.
- C. *How can Sea Grant expertise that applies statewide or to major inland waters appropriately be extended?*

Many other questions will be raised but these are central to continued growth in the mutual partnership between Sea Grant and Cornell Cooperative Extension Programs. Specific illustrations of many of the above points are illustrated in Parts II and III.



## Part II The Sea Grant Specialist Network

### Organization Wide Strategies

#### Background

In 1980, Sea Grant leadership determined principles for expansion of the specialist staff. Conclusions generally were: that Great Lakes staffing was adequate while additional positions were required on the marine coast; that future positions should be developed with collaborative local funding whenever possible; and that efforts should continue to establish campus based technical support positions for major areas of field programming.

This section discusses campus support positions and relationships of Sea Grant programs on the coasts to inland areas. Specific observations on the Great Lakes and Marine district regional programs appear in the following sections.

#### Campus Positions

Campus support positions provide a feedback loop between field staff and campus research and resources. In 1982, support positions exist in marine economics, recreation and tourism, nutritional sciences, shellfish biology and Great Lakes sportfisheries. In addition, a part-time Public Information Manager and the Great Lakes Program Coordinator provide limited communications support.

Repeated attempts to identify a single campus resource for coastal engineering have failed. To fill that continuing need, we anticipate involving a number of faculty at several Long Island universities in modest applied research projects developing a pool of talent by 1984.

Our campus support in recreation and tourism has been very effective but largely limited to support of Great Lakes programs. Increased emphasis on marine recreation by downstate field staff will generate a strong need for similar backstopping for that region. Reallocation of a portion of the current resource person's efforts to downstate is possible but represents only a partial solution. Other researchers becoming involved in marine recreation hold promise but specific mechanisms for generating downstate support in this area should be clarified by 1984.

Additional needs for technical support are emerging in business management, marine issues and aquaculture.

#### Statewide Topics

Many Sea Grant topics apply to audiences statewide--not just in the coastal region. To the extent possible and appropriate, campus resource positions should address issues of concern to inland audiences of Cornell Cooperative Extension as well as coastal clientele. Thus, both our nutritional sciences and recreation and tourism resource persons often serve non Sea Grant extension staff inland. In the latter case, Cooperative Extension support is expressly for that purpose. When the program support needs of neither Sea Grant nor other extension units justify establishing a campus support position by itself, collaborative funding should be considered. Areas of potential include "marine" education and water resource management issues.



The Finger Lakes region and Lake George/Lake Champlain Valley hold many parallels to the Great Lakes and marine coasts. A variety of mechanisms exist for combining Sea Grant staffing needs with new water resources programming in these areas. By 1984, specific mechanisms should be identified.

### Great Lakes Specialists

#### Background

The first Great Lakes office opened at Brockport in 1972. By 1975, additional offices had been opened in Oswego, Fredonia and Potsdam with a total of six regional specialists on staff. In 1978, one Oswego sportfisheries position was redefined to focus on youth education and relocated at East Aurora.

In 1980, Sea Grant Extension Program Leadership adopted a staffing strategy that concluded no additional specialist positions in the Great Lakes region were of high enough priority to commit federal Sea Grant dollars in preference to other positions downstate.

A 1981 review of Great Lakes office locations and staffing patterns resulted in consensus among staff and program leadership that steps should be taken to consolidate one person offices and that all office locations be reviewed carefully.

Program emphases of each office in 1982 appear below:

Potsdam (1 specialist located on SUNY campus)

- Tourism development
- St. Lawrence River management issues

Oswego (1 specialist located on SUNY campus)

- Sportfishery and tourism development through recreational information

Brockport (2 specialists located on SUNY campus)

- Sportfishery development through economic impact analysis and facilities development
- Marine trades assistance
- Coastal erosion
- Coastal management issues

East Aurora (1 specialist located with Erie County Cooperative Extension)

- Youth education
- Recreational safety and urban sportfisheries

Fredonia (1 specialist located with regional extension office)

- Coastal tourism and recreation
- Coastal erosion

Collaborative programming with county Extension Associations has been increasing throughout the region. In 1977 and 1978 a Special County Projects funding program provided a strong impetus with 7 of 9 counties participating by conducting programs dealing with tourism development, youth education, coastal erosion, and/or seafood use. In 1982, strongest areas of collaboration were tourism development, youth education, coastal erosion and sportfisheries information.



### Program Trends

Broad program trends having bearing on staffing needs and distribution appear below:

1. Sportfisheries: Local organizations such as fishery advisory boards, which we have been assisting over the last nine years, are taking increasingly active roles in local and regional fishery development. Sea Grant program emphases are shifting toward technical and demonstration functions in documenting economic impacts, illustrating and facilitating governmental decision making, sportfishery promotional mechanisms and facilities design.
2. Youth Education: Direct teaching by Sea Grant staff increasingly is limited to teacher and youth leader workshops. Programs that successfully involve youth in our primary subject matters are being developed and packaged for replication throughout the state. County Extension Associations increasingly include coastal emphases in their 4-H youth programming.

### Changes Anticipated

1. Great Lakes Staffing: Because of shifting program needs in sportfisheries, we will decrease general emphasis on that subject by 1984. Specifically, the position emphasizing recreational information, now based in Oswego, will be phased out by that time. In the interim, model programs in sportfishing and other recreational information will be developed to assure that local organizations have models for undertaking similar programs. This position can not be replaced, that is, the total number of Great Lakes specialists will be reduced to 5 in 1984 unless alternative funding is developed including local dollars.

The above change in staffing, in combination with the 1981 review of office locations, results in the following tentative structure to be implemented by 1984. The current office at Fredonia would become a satellite office for East Aurora. This structure requires Great Lakes-wide involvement by each specialist in his or her subject matter specialty.

<u>Office Location</u>	<u>Number of Positions</u>	<u>Geographic Area</u>	<u>Primary Subjects</u>	
East Aurora	one	L. Erie and Niagara R.	Erie-Niagara issues Youth Development	(70%) (30%)
Brockport	two	Niagara County through Cayuga County	Sportfishery and Marine Trades Erosion Management	(100%) (100%)
Oswego and Potsdam or Oswego only	two	Oswego County through St. Lawrence County	Tourism and Business Development Coastal issues and Leadership Development	(100%) (100%)



2. Youth Education: To accelerate the development of county based youth programs, a special funding mechanism will be initiated in 1983. Administered similarly to the Youth Community Development Program, it will enable modest program development grants to counties initiating original coastal-related programming. The Great Lakes Youth Education Specialist will have lead responsibility for the program. It will be extended for a maximum of three years depending on results.

### Marine District Specialists

#### Background

The first marine district office opened at Stony Brook in 1972. By 1975 additional offices had been opened in New York City and Riverhead. In 1982, one New York City based specialist position was expanded to include the Lower Hudson Valley and was relocated to New City in Rockland County. A new position was located in Nassau County. Both of these positions are funded in part by County Extension Associations.

In 1980, Sea Grant Extension Program Leadership adopted a staffing strategy that concluded additional specialist staff were required to meet the priority educational needs of the marine district--especially in sportfishery and tourism development.

Program emphases of each office in 1982 appear below:

Riverhead (1 Program Coordinator and 2 specialists located at the Cornell University Laboratory)

- Marine recreation
- Commercial fisheries technology
- Fisheries economics

Stony Brook (1 specialist located on SUNY campus)

- Coastal protection

New York City (1 specialist located with Cornell Cooperative Extension)

- Seafood utilization
- Marine education

New City (1 specialist located with Rockland County Cooperative Extension)

- Waterfront redevelopment
- Marine recreation

Plainview (1 specialist located with Nassau County Cooperative Extension)

- Seafood technology

Collaborative programming with county Extension Associations and New York City Extension has been increasing, especially in the areas of seafood utilization, marine education and waterfront redevelopment. Strong possibilities for collaboration exist in marine recreation and fisheries development.



### Program Trends

Broad program trends having bearing on staffing needs and distribution appear below:

1. Coastal Protection: It has become evident in recent years that coastal protection and engineering information needs of marine facilities owners differ significantly from those of private residence owners, the traditional audience of this program area. To date, marine facilities problems have been addressed only on an ad hoc basis.
2. Marine Tourism: Marine tourism is an extremely important component of the New York economy yet our downstate programming in this area has been limited. A research base is developing which will allow major programming in this area in the near future.
3. Hudson River Programming: Prior to 1982, programming in the Hudson Valley was conducted only in response to specific requests. Many sections of the entire tidal valley suffer problems in resource allocation, environmental degradation and haphazard development. Our program currently is directed only at the lower six counties plus New York City. Technical support for fisheries related programming is limited.

### Changes Anticipated

By 1983, the existing coastal protection position will be redirected in part to serve marine facility and port planning education needs.

By 1984, initiate with local dollar support a Marine Tourism specialist position.

In 1984, if appropriate and feasible, a central Hudson River Sea Grant specialist position will be established with county financial support.

When the New York Seafood Laboratory--currently before the State Legislature--is established at Kingsborough College the New York City position could be relocated there forming a Sea Grant programming team with the seafood technologist position.

If appropriate, a Seafood Team Leader could be designated in 1984 to provide specific leadership for the fisheries economics, commercial fisheries technology and seafood technology program areas. This role would parallel regional Dairy Team Leader responsibilities. The Team Leader would be supervised by the Marine District Program Coordinator.



### Part III. County Based Programming

#### General Approaches for County Based Programming

##### The Philosophy

Successful extension programs in New York must meet local needs with active involvement of county lay leadership and professional staff. Philosophical and fiscal support by Extension Associations is required for any program area to reach its potential for addressing local problems on a long term basis.

##### The Problems

Since technical backstopping in coastal issues was very limited, the Sea Grant program in New York first emphasized a network of regional specialists capable of addressing primary needs of our coastal areas. That network is not, and can not, be sufficient to handle specific problems of all coastal clientele in all counties. Sea Grant programs such as seafood safety and nutrition and tourism development, apply statewide. Coordinated efforts between College, Sea Grant regional and County staff will be required to meet specific local needs and to address statewide topics.

##### The Solutions

Opportunities for expanded coastal educational programs require creative strategies. Sea Grant specialists will continue to work with local, targeted audiences to address specific problems that can serve as models for other coastal communities. There is increased opportunity for Sea Grant Extension specialists and county staff to cooperate and collaborate in programming to meet local needs.

To respond to areas of concentrated coastal education needs, a variety of mechanisms have been employed. These include:

- Specialized training for county staff.
- Temporary assignment of Sea Grant staff to a particular geographic area.
- Temporary Sea Grant funding for special county staffed efforts.
- Collaborative funding of regional specialist or county positions for a specified period.

These and other funding and staffing combinations will be required to meet future program needs.

The sections that follow include county-by-county summary of past involvement in Sea Grant related programs, Sea Grant program strengths in that geographic area, and possible goals for programming in each county for both 1983 and 1985. These are meant to stimulate discussion and prompt exploration of alternative program strategies for the future.

#### County Programs in the Great Lakes Region

##### General Observations for the Region

Most counties have participated actively in one or more Sea Grant program areas. Consumer fish use and youth education programs have been most common but individual projects have involved many other subjects. Tourism development appears to hold much promise for collaborative programming region wide. Development of youth and seafood oriented collaborative programming continues. Applicability of other subject areas is more variable by county.



Goals for programming in all Great Lakes counties include:

1. Regular communication and appropriate cooperative programming between county and regional staff.
2. At least one 4-H or other youth program in each county focuses on coastal topics.
3. Seafood related topics are included in foods and nutrition programming in all counties.

#### County-by-County Observations

Chautauqua. Conducted jointly funded bluff stabilization program. County provides support staff for Sea Grant regional office. Varying degrees of collaborative programming conducted in youth education, consumer fish use, aquatic plant management, tourism development and coastal erosion.  
1983 Goal: Collaborative tourism development programming is initiated.

Erie. Houses the Great Lakes youth education office. Collaborative programming in youth education and consumer fish use.  
1983 Goal: Expansion of coastal youth programming and involvement in coastal issues.

Niagara. Conducted jointly funded programs in youth education, fish preparation and tourism development. Considerable collaboration on sportfisheries programming.  
1983 Goal: Active collaboration on Seaway Trail Development, sportfisheries economic impact analyses and erosion management.

Orleans. Conducted jointly funded fish preparation and youth programs.  
1983 Goal: Active collaboration on erosion control and sportfisheries impact programming.

Monroe. Conducted jointly funded programs in fish preparation, youth education and sportfishery development including collaborative funding of staff support to Fishery Advisory Board. Other collaborative programming in youth education and erosion control.  
1983 Goal: Expansion of coastal youth programming.

Wayne. Conducted jointly funded youth education program. Other collaborative programming in erosion control and fish preparation.  
1983 Goal: Collaboration on bluff stabilization programming. Expansion of coastal youth programming.

Cayuga. No jointly funded programs to date. No formal collaboration to date.  
1983 Goal: County and regional staff formally determine whether collaborative programming should be initiated.

Oswego. Conducted jointly funded programs in fish preparation, tourism development and erosion control. Extensive collaborative programming in mid 1970's in tourism development and sportfisheries. Continuing collaboration in erosion control and youth programs.  
1983 Goal: Active involvement in determination and conduct of regional tourism programming.



Jefferson. No jointly funded programs to date. Collaborative programming in fish preparation, sportfisheries development and St. Lawrence Valley issues.  
1983 Goal: Active involvement in determination and conduct of regional tourism programming.

St. Lawrence. Conducted jointly funded small business management programs which was repeated without special funding. Collaboration on youth project in oil spill contingency planning. 4-H hospitality training.  
1983 Goal: Active involvement in determination of regional tourism programming. Continuation of youth programming.

### 1985 Goals

Lake Erie/Niagara River Tourism Development. This program matures and expands to the extent that a regional tourism development position (both coastal and inland) can be considered with collaborative funding by Sea Grant, Chautauqua, Erie and Niagara Counties. A formally constituted regional program team involving faculty and county and regional staff established and collaborative programming initiated would be a major step toward this goal.

Niagara River Programming. A formally constituted program team involving faculty and county and regional staff is established and collaborative programming initiated.

Small Business Program. Current efforts in Oswego and St. Lawrence Counties and by regional Sea Grant staff develop to the point that a regional small business position can be considered. A formally constituted regional program team involving faculty and county and regional staff established and collaborative programming initiated would be a major step toward this goal.

4-H. Two or more 4-H staff have coastal programs as part of their position descriptions.

### County Programs in the Marine Region

#### General Observations for the Region

Most counties have participated in one or more Sea Grant program areas. Consumer fish use, waterfront redevelopment and youth education programs have been most common with fewer activities in coastal erosion and marine recreation and tourism. Tourism development, consumer fish use and youth education programs hold much promise for expansion in the entire region. Applicability of other subject areas is more variable by county.

Goals for programming in all Marine Region counties include:

1. Regular communication and appropriate cooperative programming between county and regional staff.
2. Seafood related topics are included in foods and nutrition programming in all counties.
3. At least one 4-H or other youth program in each county focuses on coastal topics.
4. Community issues programming in each county includes coastal emphases.
5. Ties exist between commercial agriculture and commercial fishing programming.



### County-by-County Observations

Suffolk. Conducted jointly funded programs in seafood use, marine education and coastal management. Cosponsored marine youth education position. Cooperative programming on producers forums and newsletter production.

1983 Goals: Integrate producers forums. Increase seafood and community issues/tourism programming.

Nassau. Conducted jointly funded programs in seafood use and seafood technology. Cooperative programming in seafood use, marine facilities and youth education.

1983 Goals: Continued development of seafood and youth programming. Initiation of marine business programming.

New York City. Conducted jointly funded programs in waterfront development and youth education. Collaborative programming in consumer fish use.

1983 Goals: Expanded involvement in marine education programs and increased media collaboration.

Westchester: Jointly funding Hudson River Sea Grant position.

1983 Goals: Involvement in marine education and seafood programming.

Rockland. Jointly funding Hudson River Sea Grant position. Cooperative programming in waterfront development.

1983 Goals: Involvement in marine education and seafood programming.

Putnam: Jointly funding Hudson River Sea Grant position. Conducted jointly funded programming in marine education and seafood use. Collaborative programming in waterfront redevelopment.

1983 Goals: Expanded program in marine education, seafood use and Hudson River issues.

Orange. No jointly funded programs to date. Little program collaboration to date except for sportfishing derby project.

1983 Goals: Initiate programming in marine education and seafood use. Expand programming in Hudson River issues.

Dutchess. No jointly funded programs to date. Collaborative programming in marine facilities.

1983 Goals: Initiate programming in marine education, seafood use and Hudson River issues.

### 1985 Goals

Lower Hudson River Programming. This program develops to the extent that the specialist position continues and is at least 50% funded by all six of the counties involved. In addition, select county staff in each county have an identifiable program commitment to River oriented programming.

Mid Hudson River Programming. In the next several years models for River oriented programming will be developed and tested on the Lower River. The appropriateness of developing similar programs for the Mid Hudson (north to the Troy area) will be determined and alternate implementation strategies identified.

A variety of groups along the Hudson River identify the value of a fisheries extension specialist. This position could focus on expanding recreational fishing,



enhancing commercial fishing, and addressing issues and concerns in seafood utilization including fish contaminants.

New York City. A community development program is established including collaborative programming on waterfront redevelopment.

Nassau County. Marine business and youth education programs develop to the extent that county or collaboratively funded positions are considered.

Suffolk County. The marine youth education program continues. County funded commercial fisheries program, now under consideration, is a reality. Significant home economics staff commitment to seafood use and nutrition continues. Tourism programming expands.



## LONGER TERM OBJECTIVES - NEW YORK SEA GRANT EXTENSION PROGRAM

April 1983

Draft 2

The mission of this Extension Program is to:

1. Transfer knowledge to persons who can use it to solve coastal problems.
2. Stimulate appropriate persons to apply this knowledge to solve problems.
3. Stimulate researchers to generate knowledge needed to solve coastal problems.

Important components to fulfill this mission are:

1. Implementing problem solving educational programs and activities with: commercial fishermen, marine recreation and tourism industries, coastal management decision-makers (including officials of town, county and ports; citizen leaders and the public); minority urban youth, and consumers of marine foods.
2. Maintaining and furthering effective working relationships with other agencies and groups to use resources more efficiently and implement programs more effectively.
3. Assisting in developing the directions of future research efforts so they are in optimum accord with needs of the coastal users and the welfare of society.
4. Increasing the proficiency of the Sea Grant Extension staff to execute programs relevant to the needs of the coastal users.

Key benchmarks to be reached over the next four years are:

### Educational Programs

- Increase to 40 percent the proportion of coastal marina operators who identify Sea Grant as valuable to them.
- Have 20 percent of coastal angler leaders see value in Sea Grant.\*
- Have 15 percent of 4-H coastal youth involved with coastal projects.\*
- Have 2,000 minority youth annually involved with marine activities stimulated by Sea Grant.

### Working Relationships

- To have 85% of "Looking Toward 1990" implemented.\*\*
- To have extension administration assume full financial support for a Sea Grant position.
- To have 7 faculty and 5 other staff with time committed to the Sea Grant Extension Program in 9 departments of SUNY, Cornell.\*
- To have 15 counties where association staff plans of work identify Sea Grant Extension activities.
- To have 8 or more counties downstate make sufficient contribution to support 1 1/2 Sea Grant Extension college staff position.
- To initiate a successful joint effort with another NOAA component each year.\*\*

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\*Increases an earlier similar objective.

\*\*New Objective in 1983.



### Research

- To have 70 percent of field staff working closely with one or more research projects.
- To have 20 percent of researchers working closely with field staff.

### Staff Effectiveness

- To have 80 percent of staff each year completing valid evaluation of one or more programs.
- To have at least one candidate with demonstrated Extension Sea Grant competency available for one-third of the specialist vacancies that occur.
- To have extension associate promotions primarily recognize responsibility, ability and accomplishments.
- To develop a cassette training resource pool with 3 cassettes produced annually by Sea Grant Extension staff or others.\*\*

### Achieved

Longer term goals achieved in New York's first decade include:

### Educational Programs

- Increased to 30 percent the proportion of the following audiences who identify Sea Grant as valuable to them:
  - A-commercial fishermen
  - B-bay fishermen
  - C-marine contractors
- To have 20 percent of coastal development and planning groups identify Sea Grant as valuable to them, particularly as it relates to coastal zone management aspects.
- To have five percent of 4-H coastal youth currently involved with marine type projects.
- To have 1,000 minority youth annually involved with marine activities stimulated by Sea Grant.

### Working Relationships

- To have 50 agencies with whom we work willing to identify the Sea Grant Extension Program as valuable to them.
- To have two county Cooperative Extension Associations provide \$1,000 or more towards Sea Grant Extension Service efforts.
- To have two or more Sea Grant Extension staff located in Extension Offices.
- To have program evaluations flow through program leadership but other details flow through Extension Representatives.

### Research

- To have two college-based extension associates with orientation to marine subject matter.

### Staff Effectiveness

- To retain all, but only, staff doing an excellent job and best suited to this role.
- To have 90 percent of major audiences within one hour's drive of a Sea Grant Extension Service office.
- Development of a recognized promotional ladder.

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\*\*New objective in 1983.

# **EDUCATION AND TRAINING**

## Education and Training

**Introduction:** New York Sea Grant has given high priority to the support of graduate students recognizing that educated and trained graduates are among the most important products of the program. In New York, graduate and professional training has been the subject of a variety of experiments--some more successful than others. As K-12 education became important to National Sea Grant, we expanded our already established youth education program within Sea Grant extension to include curriculum development. Curriculum development is not given as high a priority as graduate support nor is technician training. The summary chart for Education and Training Activities is Table E1. Full project titles are given in Table E2; journal articles produced from this unit are listed in Table E3. The distribution by program element of all students supported by Sea Grant is shown in Figure E1. Table E4 shows the academic disciplines in which those students were enrolled. And, Table E5 lists the first employment type of all graduates who had Sea Grant support.

**Getting Started:** Recognizing the centrality of education and training to the Sea Grant concept and mission, we sponsored a project "Forecasting Manpower Needs--A Planning Grant" as a part of the first institutional proposal. The objective of this project was to assess employment opportunities in the marine sector and, as appropriate, design training programs to respond to the needs. Results of that research indicated that traditional marine employment opportunities were diminishing because of the state's dwindling marine industrial base. The planned program was terminated at the request of the investigators because of this rather gloomy picture. Since that initial attempt, education activities by New York Sea Grant have focussed on experiments which, when successful, have been continued.



Table E1. Program Element Summary

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Sea Grant Traineeships and Scholars				E/I-3									
Doctoral Studies of Marine Industries					E/I-4		T						
Interns to Assembly Science Advisor		E/I-1				C							
Coastal Law Fellows				E/I-2									C
Ocean Engineering Student Projects			E/E-1				E/E-4	E/E-3					
Engineering and Marine Technology					E/I-5	T							
Engineering Research and Education								E/E-2		T			
AQUAVET Training Program						E/A-4				E/A-5			
Policy Studies Scholars											E/I-6		
Sea Grant Post-Doctoral Fellows												E/I-8	
Congressional Internship													E/I-9
Business Management Training Seminars				E/A-3									
Transportation Curriculum Development							E/T-1						
Tourism Hospitality Training							E/R-1						
Marine Technician Training	T/A-1												
Model K-12 Education Curriculum							E/K-1						
Please Go Near the Water							E/K-2						
Continuing Marine Education							E/K-4						
Marine Related Education Materials								E/K-3					
Comprehensive K-12 Marine Education									E/K-6		C		
Adapting Coastal Resource Curriculum									E/K-8				
Forecasting Manpower Training Needs	E/M-1												
Long Island Marine Education Needs			E/A-1										
Analysis of TV Spot Announcements		R/S-6											

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Percentage of federal funds	10	2	4	16	18	20	18	16	13	15	13	11	15
Percentage of pledged match	-	5	2	3	1	0	10	8	2	6	1	0	0
Percentage of total projects in year	8	6	9	13	14	12	15	12	9	8	10	4	8
Number of participating faculty	2	2	3	5	5	5	8	6	5	4	4	2	3
Disciplines of participating faculty	SOC BIOL	REC PHYS	PHYS GEOL MSENG ADM	PHYS LAW BA ADM	PHYS LAW ADM	LAW ENVENG ADM	LAW CENG REC VET ADM	LAW ENVENG VET T ADM	LAW ENVENG VET T EXT ADM	LAW VET T ADM	LAW PA T ADM	LAW ADM	ADM
Research Publications - Articles	-	3	-	-	-	1	1	2	2	-	1	-	-
Reports	-	2	7	5	3	-	-	-	4	-	-	-	-
Popular	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	1	-	-	-
Extension Effort-FTE - Marine	0.0	0.0	0.9	0.9	0.9	1.3	1.9	1.8	2.3	1.5	1.0	0.9	0.8
Great Lakes	0.0	0.0	1.0	0.7	0.1	0.0	0.6	1.3	0.9	0.8	0.5	0.5	0.4
Extension Outreach - Publications	-	-	-	-	-	2	1	1	1	-	-	-	-
Information Pieces	-	-	-	-	-	-	-	1	-	-	1	-	-
Audio-Visual	-	-	-	-	-	-	-	-	-	-	-	-	2
Newsletter	-	-	-	-	-	-	-	X	-	-	-	-	-
Number of Participating Students	-	4	8	13	20	12	6	5	5	4	6	4	1
Theses Produced	-	4	5	1	7	10	1	1	2	-	-	-	-

## Education: Introduction

Table E2. Project Titles

E/A-1	Development of a Coordinated Program of Marine Science Education in Public and Private Institutions on Long Island	Brennan/ Squires
E/A-3	Business Management Training Seminars for Marine Industries	Parr
E/A-4	AQUAVET: A Training Program for Aquatic Veterinarians	Abt/ Rickard
E/E-1	Support for Ocean Engineering Student Projects	Herman
E/E-2	Development of a Marine Engineering Research and Education Program	Liu
E/I-1	Scientific Advisory Internships for the New York State Assembly	Various
E/I-2	Problems in Coastal Law - Legal Traineeship Program	Reis
E/I-3	Sea Grant Scholars	Judd
E/I-4	Doctoral Stipends for Studies of Marine Industries	Various
E/I-5	Traineeships in Engineering and Marine Technology	Various
E/I-6	Sea Grant Policy Studies Scholars	Adams/ Wise
E/I-8	Sea Grant Postdoctoral Scholars	Various
E/I-9	Sea Grant Congressional Interns	Various
E/K-1	Developing a Model K-12 Marine Education Curriculum with Concomitant Annotated Bibliography	Abrams
E/K-2	Please Go Near the Water (A Multi-Disciplinary Approach to Teaching the New York City Waterfront)	Reese
E/K-3	Development and Implementation of Marine-Related Infusion Materials for Secondary School Curriculum: Second Year - American History	Siegel/ Abrams
E/K-4	Development and Implementation of a Multi-Faceted Adult Education-Continuing Education Program in Marine Environmental Education	Jaeger
E/K-6	Development of a Comprehensive K-12 Marine Education Program for New York State	Solomon/ Wise/ O'Dierno

E/K-8	Development of Local Materials to Supplement and Adapt the Coastal Resource Curriculum for New York State	Jaeger
E/M-1	Forecasting Manpower Training Needs in Future Aqua-Business Related Occupations	Francis
E/R-1	Hospitality Training Program for Coastal Tourism and Recreation Industries and Communities	Dee
E/T-1	Development of a Marine Transportation Education Program	Cesario
I/P-1	Strengthening Marine Science Capabilities and Programs at the University of Concepcion, Chile	Duedall/ Chuecas
R/S-6	An Analysis of Factors Involved in and Potential Effectiveness of TV Spot Announcements in Changing Public Attitudes	Hanselman
T/A-1	A Proposal for Improvement and Diversification of Marine Technology Training Programs at Cedar Beach Mariculture Center, Suffolk County Community College	Smith



Education: Introduction

Table E3. Journal Articles

Abolafia, M.

Coordinating for the Collective Good: A Study of Coastal Zone Planning.  
Administration and Society, Vol.11, No.2, August 1979.  
7900

Abt, D.; Rickard, C.

Aquavet: A Program in Aquatic Veterinary Medicine.  
JAVMA, Vol.176, No.2, 1980.  
8000

Francis, J.; Busch, L.

Water Recreational Activities in New York State and the Effect on Associated Industries.  
New York's Food and Life Sciences Bulletin, No. 31, August 1973.  
7300

Francis, J.; Busch, L.

Fulton and South: Prospects and Potentials of New York State Seafood Processing and Wholesaling Industries.  
New York's Food and Life Science Bulletin, No. 33, August 1973.  
7300

Francis, J.; Busch, L.

New York State's Commercial Fisheries: Industry and Manpower Projections.  
Social Sciences, Rural Sociology, Vol. 2, No. 28, June 1973.  
7300

Rickard, C.; Abt, D.

Veterinary Medicine in Aquaculture Gains Importance as Industry Grows.  
Aquaculture Magazine, May/June 1980.  
8000

Rumer, R.; Yu, P.

Modelling Ice Dissipation in Eastern Lake Erie.  
Journal of Great Lakes Resources, Vol.4, No.2, 1979.  
7800

Safai, S.; Herman, H.

Microstructural Investigation of Plasma-Sprayed Aluminum Coatings.  
Journal of Thin Solid Films, Vol.45, 1977.  
7700

Wake, A.; Rumer, R.

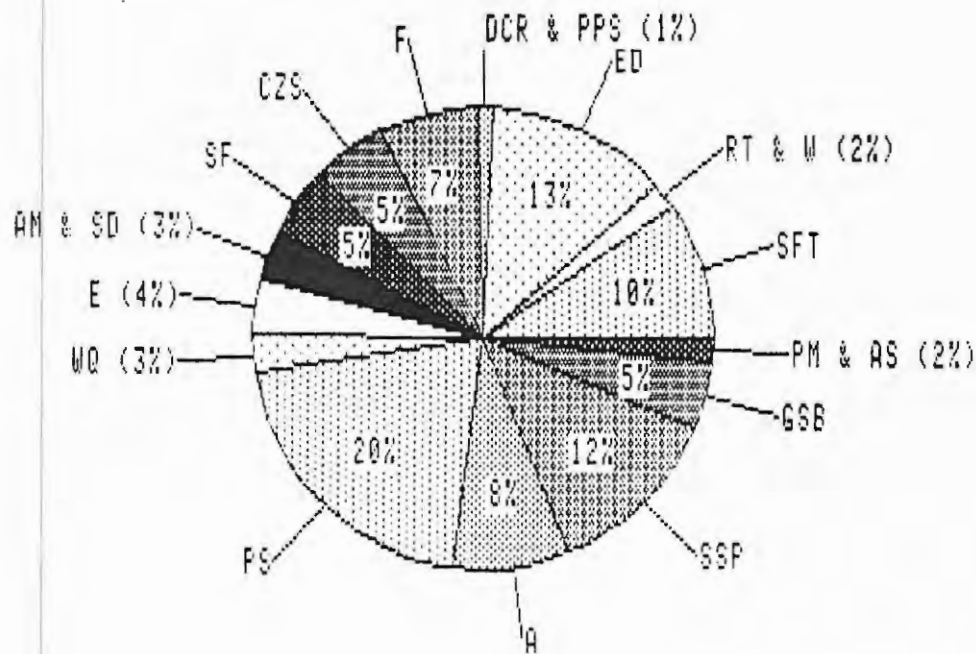
Modeling Ice Regime of Lake Erie.  
Journal of Hydraulics Division, Vol. 105, 1979.  
7900

Weyl, P.

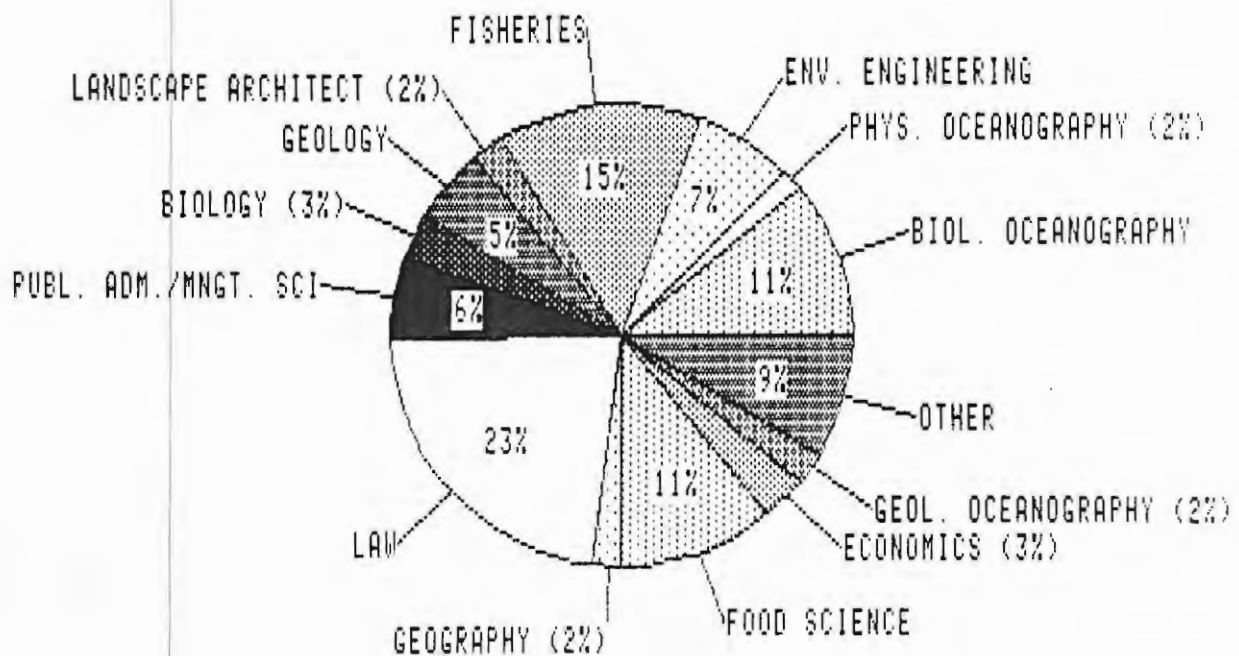
Simple Information Systems for Coastal Zone Management.  
Coastal Zone Management Journal, Vol. 9, No. 2, 1982.  
8200

Figure E1. Distribution of Sea Grant Students

DISTRIBUTION OF STUDENTS AMONG PROGRAM ELEMENTS



DISTRIBUTION OF STUDENTS AMONG DISCIPLINES



## Education: Introduction

Table E4. Distribution of Students Receiving Sea Grant Support Among the Academic Disciplines

Discipline	Number of Students	Discipline	Number of Students
Biology	10	Landscape Architecture	7
Business Admin.	1	Law	77
Chemistry	2	Medical Sciences	1
Economics	11	Microbiology	3
Education	3	Physical Oceanography	6
Environmental Engineering	23	Chemical Oceanography	3
Materials Engineering	3	Geological Oceanography	7
Extension	1	Biological Oceanography	37
Fisheries	49	Public Admin./Mangt. Sci.	20
Food Science	37	Physics	1
Forestry	1	Planning	1
Geography	6	Recreation	4
Geology	18	Sociology	2
Veterinary Medicine	3		

Table E5. First Employment Experience of Graduates Who Had Received Sea Grant Support

Private Sector	37.5%
marine-related	20.3%
not marine-related	17.2%
Government	26.3%
federal	8.0%
state	6.7%
local	11.6%
University/Not-for-Profit	36.1%
faculty	7.7%
staff	12.5%
student	15.9%

## Graduate and Professional Education

Most graduate students receiving support from Sea Grant do so through the Sea Grant Scholar Program. But there have been other programs which have supported graduate students and candidates for professional degrees. The Scholar Program and these various other programs of student support are described in the following paragraphs.

**Sea Grant Scholars: What:** In 1974 the Board of Governors approved a policy of funding graduate stipends from the Institute rather than as graduate research assistantships awarded through the campuses. The procedures adopted were closely modelled on those introduced that same year by California Sea Grant. Termed "Sea Grant traineeships" until 1980, these awards are now called Sea Grant Scholar's because of the greater prestige of the title. The stipend for Sea Grant Scholars is uniform among participating campuses and is fixed by the Board of Governors at a level competitive with better stipends at State University and Cornell campuses. Stipends in 1974 were \$4,500 for 12 months and have been \$6,750 per year for the past three years. **Why:** Advantages of the Sea Grant Scholar system are:

- o High visibility of Sea Grant, and the Sea Grant Institute, as the source of the stipend;
- o Tax-free status of stipends, in general, enhances their appeal for the Scholar;
- o Greater prestige of The Scholar award stipend than of a research assistantship;
- o Freedom from indirect costs for the stipend, reducing costs of graduate student support;
- o Greater awareness by the Sea Grant Institute of students being supported, the nature of their research, and the development of the student during and after his or her education;
- o Fuller understanding of the research and its implications obtained through contact between Sea Grant Scholars and assistant directors for program.

Disadvantages of the Sea Grant Scholar system are:

- o Uniform stipend levels overpay at some campuses and underpay at others
- o Sea Grant procedures make award of Scholar stipends at the prime time of recruitment of graduate students difficult, resulting, in some situations, in Scholars being dominated by foreign students or being of less than the best students.

Terms of the award of Sea Grant Scholars are stated in the brochures incorporated into this volume.

**Outcome:** Table E6 provides the funding history of this project. The Tables accompanying the Research Element Summary Tables list students and their thesis titles and first occupations.



**Education: Graduate**

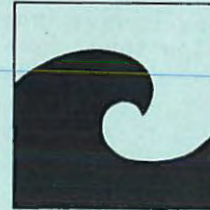
**Table E6. Sea Grant Scholars: Funding History**

1974-75	\$149,000
1975-76	\$166,500
1976-77	\$168,700
1977-78	\$170,000
1979	\$181,500
1980	\$192,500
1981	\$193,750
1982	\$206,250
1983	\$212,500
1984	\$249,750
Total	\$1,890,450

**Doctoral Stipends for Studies of Marine Industries: What:** Support for doctoral students was provided. Stipends of premium value (\$6,000 per year for a term of not more than three years) were competitively awarded on a statewide basis to doctoral candidates. In addition to the stipend, \$1,000 in costs (travel, etc.) were awarded to the student through the faculty advisor. **Why:** Studies of structural relationships, economic factors, regulatory milieu of marine dependent industries were not then (or now) fashionable. It was reasoned that such studies would make excellent doctoral dissertations and that if an attractive package was assembled, such studies could be obtained without faculty having to commit themselves to the research. In-depth studies of marine industries could be gained without incurring costs for a research project. **Outcome:** The program was not successful and was terminated when it became clear that completion rates of the awardees was unsatisfactory. Table E7 gives the funding history for the Doctoral Scholars. Table E8 lists Scholars in this project and their thesis title and Table E9 gives the first occupation of these scholars.

**Table E7. Doctoral Scholars: Funding Summary**

1975-1976	\$6,000
1976-1977	\$6,000
1978	\$21,000
1979	\$14,000
1980	\$14,000
Total	\$61,000



## Sea Grant Scholar Award Program Policy

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### PURPOSE

Sea Grant Scholar Awards are given to further the purposes of the National Sea Grant College Program by promoting education, training, and research in the fields of marine science, engineering and related disciplines that will assist the state and the nation in developing marine resources. Scholar Awards are conceived as a method of stimulating graduate study and providing support for students who carry out research that furthers the objectives of the National Sea Grant Act.

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### CONDITIONS OF AWARD

A Scholar Award is given to a student, identified by a faculty member holding a Sea Grant research award, who will be working toward a recognized degree in an approved graduate program under the supervision of that faculty member. The scholar must be registered as a full-time student and should not simultaneously hold other graduate assistance awards such as teaching or research assistantships. The only stipulation beyond regular requirements of the student's degree program is that the subject of the thesis or research paper prepared by the student must be approved by the Sea Grant Institute, within three months of the initial appointment.

Sea Grant scholars are not obligated to perform services other than those required of all students working toward that degree for which they have matriculated. No hourly requirements are to be set, for the scholar is not considered an employee.



#### TERMS OF THE AWARD

Scholar Awards are granted to students to provide support for them as they move forward in their degree programs. To afford the most benefit to the most students, an award for no less than one semester will be made. Scholar Awards will be given only for one of three specific time periods:

- full calendar year: academic year plus one summer. The summer session may either precede or follow the academic year;
- academic year only;
- one semester only; applicable when the student will complete degree requirements at the end of the semester, or the project terminates at the end of the semester.

In the last instance, the Scholar Award could be extended up to a full calendar year if the student's program continues beyond termination of the project. A one-semester award will be rare. Scholar Awards may be considered for succeeding years provided that the research subject continues to be applicable and that funds are available. Requests for such continuation must be made in writing by the faculty member involved. Upon completion of the degree requirements of one scholar, supervising faculty may apply to New York Sea Grant Institute for a Scholar Award for a new student for the remainder of the award period.

#### MAINTAINING ELIGIBILITY

Students maintain eligibility for Scholar Awards by carrying out their research diligently and making good progress toward the completion of the thesis or research paper. Students must remain in good standing on their campus and within their degree program. If a student loses good academic standing, according to policy at his or her institution, or fails to make good progress, the Sea Grant Scholar Award will terminate immediately after written notification to the Sea Grant Institute by the student's advisor and confirmation by the graduate dean or other administrative official.

#### STIPEND

The stipend for the Scholar Award is \$6,750 for a 12-month period, paid in bi-weekly installments of approximately \$260. When the award is granted for less than a 12-month period, the total award is reduced accordingly.

#### TAX STATUS

We have been advised that Scholar Awards are tax exempt under the above stated conditions. Students should consult their local Internal Revenue Service office for a definitive ruling.

#### TUITION WAIVER

Discussions with authorities on campuses participating in the Sea Grant program suggest that tuition waivers will be available to scholars. However, such waivers will depend upon local campus policy and students should discuss this matter with their local graduate school. The Provost for Graduate Education and Research, State University of New York, has ruled that Sea Grant Scholar Awards qualify for tuition waiver within the State University System under applicable policies of the Board of Trustees.

#### RESEARCH RESULTS

It is vitally important to Sea Grant that research results are disseminated to those who can use them. Theses and reports covering the research carried out by scholars are very significant in this respect. The Sea Grant Institute requires copies of all such materials.

#### HEALTH BENEFITS

Sea Grant scholars are eligible to participate in the health insurance plan for fellows and students offered by The Research Foundation of State University of New York and the similar plan offered by Cornell University (Cornell students only). Every fellow must fill out and return a health insurance enrollment card accepting or declining the health insurance plan offered by The Research Foundation. For details on costs, coverage and benefits, call or write Geri Adams, Fiscal Assistant (518-462-5834) or Ed Bollinger, Assistant Director for Management (518-462-5836) at New York Sea Grant Institute.

Table E8. Doctoral Scholars: Theses

Current

Ruth MacNeal 8005

Graduated. Thesis Submitted

Thomas Kopp  
THE ECONOMIC CONSEQUENCES OF POLLUTION DISCHARGES IN NON-RIVER DOMINATED  
ESTUARIES  
8005

Status Uncertain

Donald Hoyte 7805

Table E9. Doctoral Scholars: First Occupation

Donald Hoyte  
7805  
Occupation unknown

Thomas Kopp  
8005  
Economics Instructor, Rensselaer Polytechnic Institute

Ruth MacNeal  
8005  
Vice President, Investment Firm, New York City

**Sea Grant Internships for Agencies and the Legislature: What:** In 1971 the New York State Assembly was awarded funds to develop a science advisory office. Dr. Seville Chapman, retired General Electric Company researcher, was appointed Science Advisor. He approached the Sea Grant program about a collaborative project. Students from State University, Cornell, and other campuses, were sought, and internships awarded jointly by the Science Advisor and the Sea Grant program. Dissertation subjects were largely specified by the Science Advisor. **Why:** Sea Grant, through this program, achieved visibility among state decision-makers and gained a series of dissertations of importance on marine issues. **Outcome:** The program was largely successful because of the considerable attention given the students by the Science Advisory staff. A weakness in the program was the lack of contact between student and Assembly Members or their staffs. The program terminated with the death of Dr. Chapman and the departure of his close associate Dr. Glenn Stephenson. At that time there was increasing difficulty in identifying appropriate student level subjects to be pursued.



**Education: Graduate**

Table E10 summarizes the funding of this project. Tables E11 and E12 give a listing of the students and their theses and of their first occupations, respectively.

**Table E10. Legislative Interns: Funding History**

1972-1973	\$17,960
1973-1974	\$25,759
1974-1975	\$6,000
1975-1976	\$3,200
1976-1977	\$28,250
Total	\$79,169

**Coastal Law Fellows: What:** A program of support for law students engaged in coastal law research was initiated in 1974 together with the Coastal Law project. Initially students were paid a stipend during the summer months only, but later it was found desirable to involve them throughout the year and the stipend was adjusted accordingly. **Why:** In its earliest phases the Coastal Law program had as an objective involvement of students in the development of background, and publishable, "law review" type papers. The program used a variety of formats in the intervening years. **Outcome:** While a number of excellent students gained exposure to coastal law and in most instances found the participation interesting and often useful in gaining employment, there were disappointments: Few have found occupations in which their research has direct application; research by the students required considerable supervision and only in exceptional cases directly resulted in publishable materials. Thus while the experiment commenced with summer research, expanded to full-year participation, the load on faculty was heavy, perhaps counter-productive. In the past few years, with lesser student participation, faculty output has been higher.

Table E13 gives the funding history of this project. For a list of Coastal Law Fellows see Tables R46 and R47 in Research: Program Element: Program Support.

**Table E11. Legislative Interns: Theses**

**Graduated. Thesis Submitted**

**Mitchell Abolafia**

**COORDINATING FOR THE COLLECTIVE GOOD: A STUDY OF COASTAL ZONE PLANNING**  
7705

**\*Donald Ash**

**FEASIBILITY OF GIANT BYPASSING ON THE SOUTH SHORE OF LONG ISLAND, NEW YORK**  
7305

**William Faraday**

**UPTAKE OF CADMIUM BY ZOSTERA MARINA (EELGRASS)**  
7705

**Michael Fraum**

EVALUATION OF RESEARCH AND COMMERCIAL EFFORTS IN AQUACULTURE IN THE USA WITH  
EMPHASIS ON APPLICABILITY FOR NYS

7705

Jay Ginter

MARINE FISHERIES CONSERVATION IN NEW YORK STATE: POLICY AND PRACTICE OF  
FISHERIES MANAGEMENT

7305

Bruce Heap

CURRICULUM DEVELOPMENT AND EDUCATIONAL RESEARCH FOR THE AQUATIC ENVIRONMENT:  
AN ANNOTATED BIBLIOGRAPHY

7605

Louise Lagna

THE RELATIONSHIP OF SPARTINA ALTERNIFLORA TO MEAN HIGH WATER

7405

Seth Low

AN INVESTIGATION OF THE FEDERAL, STATE AND LOCAL OIL CONTINGENCY PLANS FOR THE  
LONG ISLAND SOUND AREA

7305

William Medeiros

LEGAL MECHANISMS TO REHABILITATE THE HUDSON RIVER SHAD FISHERY

7305

Andrew Mirchel

ENFORCEMENT OF HARD CLAMS LAWS ON THE GREAT SOUTH BAY, NEW YORK

7805

Peter Mohr

MARINE SPORTFISHERIES IN NEW YORK STATE

7605

Joseph Neafsey

DEVELOPING CRITERIA FOR THE EVALUATION OF WETLANDS

7305

Walter Retzsch

A LEGISLATIVE AND MANAGEMENT PLAN FOR THE RECREATIONAL AND COMMERCIAL STRIPED  
BASS FISHERIES OF NEW YORK STATE

7505

\*Susan Stafford

A MATHEMATICAL MODEL DETERMINING COMMERCIAL EXPLOITATION OF LAKE ONTARIO'S  
MULTISPECIES COMMUNITY

7405

Joseph Suflita

SEQUENTIAL CONTINUOUS CULTURE SYSTEMS AS SIMULATORY MODELS FOR THE FATE OF OIL  
IN FRESHWATER ECOSYSTEMS

7605

Anne Williams

EFFECTS OF FOREIGN FISHING ON THE COASTAL FISHERIES ON NEW YORK STATE

7405

Status Uncertain

Richard Ventullo 7605

\*Vincent Munley 7605

Did Not Graduate

Michael Moran 7305

\*Doctoral Candidate

**Education: Graduate**

**Table E12. Legislative Interns: First Occupation**

Mitchell Abolafia 7705 PhD student in Public Admin., Univ of California/Davis	Michael Moran 7305 Occupation unknown
Donald Ash 7305 Professor of geology, Indiana St Univ	Vincent Munley 7605 Professor of Economics, Lehigh Univ
William Faraday 7705 Engineer with Long Island Lighting Co	Joseph Neafsey 7305 Soil Conservation Service in Conn
Michael Fraum 7705 Occupation unknown	Walter Retzsch 7505 Environmental consulting firm in Md
Jay Ginter 7305 Resource analyst, NMFS, San Diego	Susan Stafford 7405 Phd candidate, NYS Col of Environ Science and Forestry
Louise Lagna 7405 Res assoc, Florida Dept of Interior	Joseph Suflita 7605 PhD candidate in microbial ecology, Pennsylvania State Univ.
Seth Low 7305 Nassau-Suffolk Regional Planning Bd	Richard Ventullo 7605 Occupation unknown
William Medeiros 7305 High school teacher in Connecticut	Anne Williams 7405 Fishery statistician: Mid-Atlantic Management Council
Andrew Mirchel 7712 Manager, Pell's Fish Dock, Montauk	
Peter Mohr 7605 Program analyst, Medicare in NYC	

Table E13. Coastal Law Fellows: Funding History

1974-75	\$27,900
1975-76	\$14,000
1976-77	\$14,000
1977-78	\$24,000
1979	\$25,400
1980	\$24,400
1981	\$31,250
1982	\$31,250
1983	\$31,250
Total	\$223,450

**Engineering Student Support Projects: What:** To gain greater involvement in Sea Grant research by engineers three experimental projects were tried. **Why:** In 1974 the Institute commissioned a study by Engineering Professors Rumer (SUNY at Buffalo), Wang (SUNY at Stony Brook) and Pergament (SUNY Maritime Academy) on involvement of engineers in Sea Grant activities. The critical finding of that group was that most engineering projects would involve a financial commitment beyond the capabilities of Sea Grant, but that many engineering needs could be adequately addressed by support of engineering graduate students. Most of the engineering support sought was in response to Extension staff who desired engineering assistance in the solution of problems they faced. **Outcome:** None of the projects initiated were successful in either gaining participation by faculty or solving problems through student research, particularly at the master's level.

The first awards in support of engineering were actually in support of a Senior Design Program at the College of Engineering, SUNY at Stony Brook. A series of grants, usually in values of \$1,000 have been made from time to time to assist this program in the purchase of materials. Resulting from it have been a series of underwater habitats and manned and unmanned submersibles.



**Education: Graduate**

In 1975-1976, in response to the Rumer Committee report, a series of engineering traineeships were commenced at SUNY at Buffalo, selected as the center for engineering development. The project was terminated after two years. The funding history of this project is shown in Table E14 and first occupations of its graduates in Table E16. Students and their thesis titles appear in Table E15.

**Table E14. Engineering Trainees (SUNY at Buffalo): Funding History**

1975-1976	\$33,000
1976-1977	\$29,250
Total	\$62,250

**Table E15. Engineering Trainees (SUNY at Buffalo): Theses**

**Graduated, Thesis Submitted**

Randy Crissman

INVENTORY OF LAKE ONTARIO INLETS AND HARBORS: NIAGARA RIVER TO STONY CREEK  
7605

Shu Nam Kam

COMPUTER MANUAL FOR CALCULATING WAVE HEIGHT DISTRIBUTIONS ABOUT OFFSHORE  
STRUCTURES  
7705

\*Gerard Lennon

FINITE ELEMENT MODELLING OF NEARSHORE CURRENTS  
7705

\*Johnnie Opara

INVENTORY OF LAKE ONTARIO INLETS AND HARBORS: NIAGARA RIVER TO STONY CREEK  
7605

Saed Safai

MICROSTRUCTURAL INVESTIGATION OF PLASMA-SPRAYED ALUMINUM COATING  
7705

Larry Turner

AN AQUACULTURE PILOT PLAN FOR LOBSTERS  
7605

\*Akira Uchida

MANAGEMENT OF SANITARY WASTE FROM RECREATIONAL CRAFT  
7605

\*Akio Wake

MODELLING THE ICE REGIME OF LAKE ERIE  
7705

Paul Yu

ICE DISSIPATION IN EASTERN LAKE ERIE AND COMPUTATION OF INCOMING SOLAR AND  
ATMOSPHERIC RADIATION  
7705

**Status Uncertain**

\*Sunwhae Chung 7705

**Did Not Graduate**

Andrew Bachman 7705

\*Doctoral Candidate

Table E16. Engineering Trainees (SUNY at Buffalo): First Occupations

Andrew Bachman 7705 Engineering firm in New York City	Saed Safai 7705 Pratt-Whitney, Palm Beach, Florida
Sunwhhee Chung 7705 Occupation unknown	Larry Turner 7605 Occupation unknown
Randy Crissman 7605 Ice research with Gulf Oil Prod, Inc. in Beaufort Sea	Akira Uchida 7605 Engineer with Pacific Consultants, Inc. in Tokyo
Shu Nam Kam 7705 Engineering firm in Hong Kong	Akio Wake 7705 Associate professor, Univ. of Guam
Gerard Lennon 7705 Professor of Civil Engineering, Lehigh University	Paul Yu 7705 Engineer, US Army Corp of Engineers
Johnnie Opara 7605 Occupation unknown	

In 1978 another attempt was made to involve students of engineering. Under the direction of Professors Liu and Kulhawy, Department of Environmental Engineering at Cornell, a project entitled "Development of a Marine Engineering Research and Education Program" was initiated. Again, there was insufficient involvement between the students and the Extension Program to warrant continuation, and the project was terminated in 1981 with the completion of student studies. The funding history of this project is shown in Table E17 and first occupations of its graduates are given in Table E19. Students and their thesis titles are given in Table E18.

Table E17. Engineering Trainees (Cornell): Funding History

1978-1979	\$12,000
1980	\$11,959
1981	\$11,240
Total	\$35,199

**Education: Graduate**

**Table E18. Engineering Trainees (Cornell): Theses**

**Graduated, Thesis Submitted**

**\*Jeffrey Earickson**

**A TSUNAMI GENERATION AND PROPAGATION MODEL DRIVEN BY VERTICAL SEABED MOVEMENTS  
8005**

**\*Nicholas Pantazaras**

**COMBINED DIFFRACTION AND REFRACTION OF WATER WAVES  
7905**

**Status Uncertain**

**Edward Clukey 8105**

**Did Not Graduate**

**Timothy O'Donnell 7912**

**\*Doctoral Candidate**

**Table E19. Engineering Trainees (Cornell): First Occupations**

**Edward Clukey**

**8105**

**Master's candidate at Cornell**

**Jeffrey Earickson**

**8005**

**Occupation unknown**

**Timothy O'Donnell**

**7912**

**Engineer with Stone and Webster,  
Inc. in New Jersey**

**Nicholas Pantazaras**

**7908**

**Occupation unknown**

**Policy Studies Students: What:** Graduate students from the Graduate School of Public Affairs, SUNY at Albany, are supported through a two-year Master's Program. The experience with the Sea Grant Institute qualifies as their requirement for service with either the State Legislature or an agency. **Why:** To develop a group within the Institute capable of analyzing needs for policies and means of moving towards meeting those needs. **Outcome:** A number of identifiable products including: an analysis of graduate students trained by the National Sea Grant College Program (published as a brochure and journal article); Sea Grant Institute Omnibus Information System; Marine Biomass Program; State Aquaculture Plan Legislation. Two graduates of the Policy Studies Group have remained with the program as fulltime Program Associates to complete assignments. One was appointed Assistant Director for Program. Policy Studies Scholars are not separately budgeted but are included in the Sea Grant Scholar pool. Graduated Policy Studies Scholars and their first occupations are shown in Table E20.

Table E20. Policy Studies Scholars: First Occupation

Current

John O'Rorke  
Catherine Crawford

Graduated, No Thesis Required

Margaret Becker  
8206  
Program Associate in Aquaculture  
Sea Grant Institute

Eileen Crumm  
8305  
PhD Candidate in Soviet Studies  
University of Pennsylvania

Sandi Goolden  
8212  
Staff, Legislative Comm.  
on Critical Transportation

Debra Hershkowitz  
8205  
Analyst, NYS Education Department

Laura McKay  
8212  
Project Manager, NYS Biomass Project

Sandra Starke  
8304  
Division of Budget  
City of Albany

Did Not Graduate

Loretta Simon  
8105  
Planner, Mid-Hudson Region



## Other Higher Education Initiatives

**AQUAVET: A Training Program for Aquatic Veterinarians:** **What:** A summer intensive training program is offered at the Marine Biological Laboratory, Woods Hole, Massachusetts for advanced veterinary medicine students and veterinary practitioners. The course is jointly sponsored by the NYS College of Veterinary Medicine, Cornell, and The School of Veterinary Medicine, University of Pennsylvania. Cooperating are the Marine Biological Laboratory, Woods Hole Oceanographic Institute and the Northeast Fisheries Center, NMFS. **Why:** Commenced in response to an idea proposed by veterinarians from the University of Pennsylvania returning from a summer at the Marine Biological Laboratory at Woods Hole, AQUAVET received enthusiastic support from H. Burr Steinbach, then a member of the National Advisory Committee, and other reviewers. The project involves large numbers of contributing faculty (35 individuals from 24 institutions in 1984). Begun as a regional project (involving students from the northeastern United States), AQUAVET soon became national in scope. In its penultimate version, practicing veterinarians were included in the student body; and in its latest version, two AQUAVET courses are run concurrently, the advanced version involving research activities. **Outcome:** After five years of support by New York Sea Grant, AQUAVET has carried on with three years of private foundation grants. AQUAVET is one of New York Sea Grant's more successful education projects. Table E21 shows the funding history of AQUAVET. Application and acceptance data are presented in Table E22. Veterinary Schools from which students have been drawn are tabulated in Table E23. Occupational history of AQUAVET students is shown in Table E24. If imitation is a sign of success, then AQUAVET benefits from its look-a-like sponsored by Texas A&M University, Aquamed.

Table E21. AQUAVET: Funding History

1976-77	\$59,800
1977-78	\$20,000
1979	\$30,000
1980	\$30,000
1981	\$44,000

Table E22. AQUAVET Student Applications and Acceptances

Year	Students		Percentage	Students	
	Applied	Accepted		Advanced Course	Research
1977	26	16	61.5%		8
1978	55	31	56.4%		4
1979	88	32	36.4%		4
1980	102	33	32.4%		5
1981	110	33	30.0%		4
1982	90	32	35.6%		2
1983	72	32	44.4%	6	1
1984	58	32	55.2%	8	2

**Education: Other Higher**

**Table E23. Veterinary Schools Attended by AQUAVET Students**

Auburn	2	North Carolina	1
California	2	Ohio	13
Colorado	19	Oklahoma	1
Cornell	62	Ontario	1
Florida	11	Pennsylvania	64
Georgia	1	Phillipines	1
Illinois	11	Purdue	9
Iowa	2	Saskatchewan	5
Kansas	7	Taiwan	1
Louisiana	3	Tennessee	1
Michigan	4	Texas	2
Minnesota	7	Tuskegee	1
Mississippi	3	Washington	3
Missouri	1		

**Table E24. AQUAVET Graduates - Occupational Experience**  
(Based on 1983 survey with 151 respondents)

<b>Current Veterinary Activity:</b>		<b>Aquatic animals encountered</b>	
Veterinary School	- 30%	(percentage of reports)	
Post-DVM Training	- 12%	Finfish	- 34%
Private Practice	- 38%	Shellfish	- 6%
Academic Employment	- 8%	Crustaceans	- 5%
Industry Employment	- 1%	Other invertebrates	- 6%
Government Employment	- 3%	Marine Mammals	- 10%
		Aquatic Reptiles	- 13%
		Aquatic Birds	- 20%
		Other	- 5%
<b>Utilization of professional skills</b>		<b>Environment in which involvement</b>	
<b>and interest in aquatic animals:</b>		<b>with aquatic animals occurs:</b>	
Fulltime	- 4%	Home aquaria	- 49%
75% Involvement	- 3%	Public Display Aquaria	21%
50% Involvement	- 1%	Commercial Aquaculture	9%
25% Involvement	- 6%	Laboratory Animal	
Less than 25%	- 60%	Research Facility	22%
No Involvement	- 27%		
<b>Is involvement a source of</b>			
<b>professional income?</b>			
Yes	30%	No	70%

**Sea Grant Post-Doctoral Program: What:** Support is provided for both recent doctoral graduates and more senior scientists, and for persons holding professional degrees where these persons bring significant special knowledge or skills to the program. **Why:** Experience suggested that bringing post-doctorals and senior scientists having critically needed skills to our research program would be a great benefit. Costs of including such awards in research project budgets where they would incur indirect costs charges, suggested alternatives should be sought. Discussions with Claes Lundgren, director, Underwater Physiology Laboratory, SUNY at Buffalo, and J.R. Schubel, director, Marine Sciences Research Center, SUNY at Stony Brook, confirmed that view. With Dr. Lundgren the present program was formulated. This recent innovation of New York Sea Grant had as its genesis a highly successful post-doctoral award, in collaboration with Dr. Michael Neushul, University of California at Santa Barbara, to Dr. Xiugeng Fei, University of Qingdao, to the Marine Biomass Program. The significant technical advances in propagating seaweed made by our research team as a result of Dr. Fei's several months with them were impressive. **Outcome:** The program seems successful but is limited by availability of funds. Table E25 lists post-doctoral fellowships which have been awarded.

Table E25. Post-Doctoral/Professional Appointments

Mats Liner, Universitat Lund--Underwater Physiology  
Howard Levine, Harvard University--Marine Biomass Project  
Linda Reynolds, SUNY at Buffalo--Staff Attorney, Coastal Law  
Project  
Massimo Ferrigamo, University of Genova--Underwater Physiology

Terms for the appointment of post-doctoral fellows are outlined in a brochure, a copy of which follows.

**Curriculum Development:** Only a few grants of this nature have been made. In general it is felt by Program Advisors, concurred in by the Governing Board, that curriculum development should be a function of the university or college. Course development aimed at the non-matriculated student (i.e. continuing or part-time education) is, we feel, best undertaken as an Extension function. Examples of the latter sponsored by the Institute have been a mixed in success: For example, E/A-3 "Business Manangement Training Seminars" had no consequential output and no impact. But, E/R-1 "Hospitality Training Program," undertaken in close collaboration with Extension (particularly Extension Specialist Stephen Brown), was productive and resulted in a continuing program by the Jefferson Community College Campus.

**Technician Training:** New York Sea Grant assessed this need through its first study "Forecasting Manpower Training Needs" and in a subsequent workshop on "Technical Training Opportunities" and decided it was not a fruitful field. Several marine technical training programs exist in the state (These were identified by the study conducted by Brennan--E/A-1 "Development of a Coordinated Program of Marine Education") which seem adequate to meet needs. One venture undertaken with Suffolk County Community College and its marine technician program was terminated prematurely.

**K-12 Education**

**Youth Education at the Beginning:** Youth education programs commenced in 1974 through Sea Grant Extension work with minority youth in New York City. That program was further developed in 1978 with an additional specialist commencing work with youth education in Buffalo and Rochester. Direct Sea Grant support of youth education peaked in 1979 and has diminished since then. However, local funding for 4-H and other Extension Youth Education has increased so that this program is stronger now than in 1979. First grants for K-12 educational materials were made in response to the National initiative in 1978. These initial awards were made to established marine educators in New York City and Long Island schools who had developed their programs through the New York State Marine Education Association (NYSMEA), founded in large part through Sea Grant Extension leadership. Products of these and other early K-12 marine education projects did not achieve the level of classroom acceptance anticipated.

**Board Policy:** Recognizing the increasing priority given to marine youth education at the national level, the Board of Governors considered the role that New York Sea Grant should play. In May, 1979, the Board concluded: "Recognizing that National Sea Grant is emphasizing youth education, ...[a] position is adopted that youth education should be pursued, but with care and thought and that an emphasis on minority education be given."

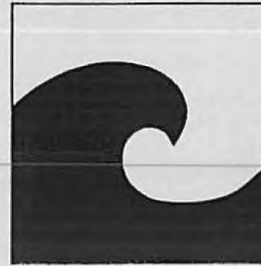
**K-12 Study Plan:** In the spring of 1979, Extension Specialist Linda O'Dierno, with assistance from regional and national marine education groups, drafted a Study Plan for K-12 Marine Education to guide the Institute's future involvement in this area. The objective of that Plan was to utilize marine education in a trans-disciplinary mode to create student-teacher involvement in the learning process while at the same time developing basic concepts relative to the world of water. The Study Plan consists of two phases. Phase I (to require 3 years for completion) involves the development of a 4-6 week multidisciplinary unit for each of grades K-6. Phase II deals with development of materials for junior and senior high school levels, based on the infusion unit format.

**Implementation of the Plan:** In May 1979 the Study Plan was distributed to marine educators along with a request for proposals for Phase I. To help review proposals and provide guidance in monitoring the course of any work supported under the Study Plan, a Marine Education Advisory Panel was created in July 1979. Members were:

Thomas Boehm, Bureau of Science Curriculum, NYS Education Department  
Robert Budliger, Office of Public Affairs, NYS Department of  
Environmental Conservation  
Barbara Waters, Massachusetts Cooperative Extension Service  
David Greene, NY Sea Grant Extension Program  
Linda O'Dierno, Sea Grant Extension Program (chair)

Funding for Phase I began in January 1980 with an award to the Staten Island Cooperative Continuum of Education. During the course of the subsequent three year program, the Advisory Panel met frequently to assess progress and, later, to assist in assuring the widest possible dissemination of final materials. Those materials, WET WORLDS - a group of 11 interdisciplinary K-6 level exercises, have been introduced into several regional and national marine





## Sea Grant Post-Doctoral Awards



### PURPOSE

Sea Grant Institute post-doctoral awards are given to further the purposes of the National Sea Grant College Program by promoting research and education in the fields of marine science, engineering and related disciplines that will assist the nation and the state in developing marine resources. Post-doctoral awards are seen as a mechanism for bringing into New York state those talents needed for specific activities over a short duration of time.

Post-doctoral appointments may be made in two classes:

**Regular:** For recent recipients of doctorates (advanced professional degrees may be substituted) from institutions other than that making application.

**Senior:** Partial support for persons on sabbatical leave or for full support for appropriate foreign scholars of advanced professional standing.

Post-doctoral awards are not seen as a means of providing additional instructional assistance or replacements for faculty who may be on sabbatical.



### CONDITIONS OF AWARD

Holders of Sea Grant Institute post-doctoral stipends are expected to carry out research of high caliber and to see that research is published in appropriate outlets. Post-doctoral fellows will be further expected to give six university-wide lectures or seminars each academic year. Campuses at which a lecture or seminar is to be given will be arranged by the Institute. The same lecture or seminar may be used on several campuses.

If a post-doctoral fellow is expected to carry-out regular instructional responsibilities, it will be expected that the host campus will contribute an appropriate share of the stipend.



## TERMS OF THE AWARD

Post-doctoral awards will be made to persons whose research or other scholarly activity will significantly contribute to the current objectives of the National Sea Grant College Program and of the New York Sea Grant Institute. In most cases, such research will be closely related to studies being carried out under Sea Grant Institute support, usually at an institution within New York State. Post-doctoral appointments will be made by the New York Sea Grant Institute, based upon proposals submitted to the institute and evaluated by a committee appointed by the Institute. Holders of post-doctoral awards will be considered as fellows of the Institute. Except in special circumstances it is anticipated that most fellows will be from institutions outside New York State. These awards may not be used to support recent graduates of the host institution.

## OBTAINING A POST-DOCTORAL AWARD

Persons wishing to propose a candidate for a post-doctoral stipend should contact the Institute for further instructions. Generally, awards will be made for 12 month periods, but may be for longer periods where the justification and circumstances are appropriate.

Persons wishing to propose a candidate for a post-doctoral stipend should contact the Institute for further instructions. Generally awards will be made for 12 month periods, but may be for longer periods where the justification and circumstances are appropriate. A proposal for a post-doctoral award consists of two parts:

- I. A statement of how the award will assist the Institute in achieving its goals.
- II. A specific statement of the candidate's planned contributions. A full curriculum vitae is required.

Use of funds from other sources as matching support for post-doctorals is desirable.

Application for post-doctoral awards may be made only by faculty who will be sponsoring the post-doctoral candidate. Post-doctoral candidates may not apply directly.

Although post-doctoral appointments are to the Institute, holders will be resident on appropriate campus. It is the responsibility of the requesting faculty member to make appropriate arrangements for office and laboratory space, housing, and, in the case of foreign scholars, all appropriate arrangements with federal and other authorities.

## STIPEND

Stipend levels may be suggested by those requesting a post-doctoral fellowship, but the level to be awarded will be fixed by the selection committee.

Arrangements in which a portion of the stipend or other expenses may be covered by funds from non-Sea Grant sources will be favorably considered. This is particularly true of senior appointments which are thought to be most appropriately awarded to faculty from other institutions who are on sabbatical leave and may be seeking partial support.

## TAX STATUS

Post-doctoral fellows may exclude up to \$300 per month or \$3,600 annually from income. This exclusion is limited to a period of three years. Certain foreign fellows engaging in research may be exempt from United States taxes for two years after arriving in the United States.

Consult your local Internal Revenue Service authorities about this and other tax matters.

## FRINGE BENEFITS

Because post-doctoral stipends do not carry fringe benefits, holders should contact the Sea Grant Institute for advice on medical insurance arrangements if the candidate will not otherwise be covered.

## RELATED EXPENSES

Research related expenditures and travel costs are not to be included in proposals for post-doctoral awards. These expenses must be covered from other funds (Sea Grant or other). The exception is travel in conjunction with the lecture series, which will be provided by the Institute.

Travel funds for foreign post-doctoral fellows to the United States and return should, wherever possible, be proposed from other funds.

education materials networks. They are shortly to be distributed to New York State teachers in conjunction with the new state K-6 science syllabus, with which WET WORLD closely interfaces.

**Future Plans:** With the conclusion of Project E/K-6, it was decided to defer action on Phase II of the K-12 Marine Education Study Plan until such time as the field of classroom marine education regains a higher level of priority and available funds exist.

#### International Project

One international project was supported through the Sea Grant Institute: "Strengthening Marine Sciences Capabilities and Programs at the University of Concepcion, Chile" carried out through Dr. Iver Duedall, SUNY at Stony Brook and Professor L.A. Chuecas, University of Concepcion. During the three year term of this award eight Chilean scientists visited Stony Brook and one M.S. degree was awarded a Chilean student. One Stony Brook student based his dissertation on the Chilean experience and several Stony Brook faculty produced research papers from their research experience.

# COMMUNICATIONS



## Communications

**Programwide Overview:** From the first, New York Sea Grant has distinguished the different roles and needs of the Institute and Sea Grant Extension with respect to information and communications. The Institute, it was determined, would have as its responsibilities those information and communication functions related to research, education, and training activities; Extension would undertake those responsibilities related to its mission in extension education. Communications has been viewed as a generalized rather than specialized function which should be incorporated into everyone's tasks. However, this broad view has been enriched by the presence, on both Institute and Extension staffs, of specialized, talented communicators.

Through the years both the Institute and Sea Grant Extension have had communications staff but their functions have been different. As an example of that difference, Coastlines, New York Sea Grant's programwide newsletter, was initiated as a communications link between the newly developing program and potential researchers, campus administrators and the public. As the utility of such a campus-oriented newsletter diminished, the well-established Coastlines took on a new look and became a publicly-oriented device. While Coastlines was first produced by the Institute, its evolution caused it to be transferred to the Sea Grant Extension Program for production. Table C1 identifies the differences in communication assignments between Institute and Extension.

Table C1. Communication Responsibilities of the Sea Grant Institute and the Sea Grant Extension Program

Institute Responsibilities	Extension Responsibilities
Communication about the program and its products: research and the expertise to promote transmission of knowledge and understanding	Communication of information generated and techniques of communication to promote use and interpretation of information
Production of:	Production and technical guidance to Extension staff on:
Technical reports	Written Materials
Sea Grant programwide information	Audio-Visual Materials
Programwide media contacts	Other communication techniques
Monitoring research production:	Production of program newsletters
Obtaining research publications	Distribution of extension and research information pieces
Distributing research publications	
Developing a management information system	

## Institute Communication Activities

**Publications:** Like most emerging programs, New York Sea Grant struggled in its formative years to quickly produce a body of written literature. Such a base of written materials would give credibility and visibility to the new research program. A major project during this phase was the MESA New York Bight Atlas Monograph Series. Heavy emphasis on in-house publication continued through 1979 with numbers of technical reports being issued by the Institute. But the publication function was de-emphasized when it was realized that these



reports, which were becoming more elaborate and diversified into several series, detracted researchers from publication in journals. The current philosophy has prevailed since 1981: Priority is given to having research published in traditional outlets and in enhancing awareness among interested groups of what information is available from the Institute. Further, in an effort to reduce costly distribution of publications, the Institute has limited its inventory of journal articles and technical reports. Requestors of publications are referred to technical libraries (we deposit publications in many university and other major libraries), NTIS, the Sea Grant Depository, and sources of publication of technical reports.

**First Impressions and Other Experiments:** The communications program has been innovative in meeting its objectives. Some of the innovations have been more successful than others. Some of these new directions are:

First Impressions - recognizing that there is always material from research which is difficult or impossible to publish in journals, the Institute created this outlet. Manuscripts accepted for this treatment are taken as submitted by the author, this special status being indicated in the publication, and are abstracted, advertised, and also catalogued by the Sea Grant Depository (as Technical Reports). Requests for copies are met through xerography of the manuscript, a process we call "demand publication." "First Impressions" are a means of making research results available prior to publication (if necessary), allow valuable data not otherwise accessible to be made available, and relieve the Institute of making a judgment on the size of a press-run.

Law and Policy Review - As the Coastal Law Scholars began full production of research papers, their output far exceeded the capacity of law reviews and other traditional outlets. Many of the papers would not qualify for publication by reason of content or because they were a lesser quality. A series was commenced and published by the Sea Grant Institute with the anticipation that other Sea Grant programs might participate and eventually share costs. This did not happen, and the series has been temporarily abandoned because of its expense--despite the fact that it was greatly sought after. Through the Sea Grant Association Legal Group, interest in such an outlet has been revived and the series may be renewed as a "national project."

Research-in-Short - This quarterly series contains abstracts of research results from Sea Grant sponsored projects. The single paragraph abstracts are prepared by the communications staff in conjunction with the authors. Barely in its second year, the series has been increasing in circulation from a base of 800, about half of whom are from out of state. A survey of 200 readers (excluding Sea Grant principal investigators and extension staff), to which 155 responded, showed that 100% read some or all of Research-in-Short, with over half sharing with 2-5 other readers and saving the publication for future reference. About 60% of the readers indicate that they order one or more articles they read. Anecdotal evidence, particularly from government-employed technical persons, suggests that the abstract often provides the level of information sought by the reader.

**Institute Communications Staffing:** In its earliest phases, the Sea Grant program was concerned with information about itself and with communications within the university community. As priority was given to publication, particularly the production of technical reports, an editorial staff was developed. The leader of that editorial group, Jean McAlpine Hopkins, contributed greatly to the evolving program so that the title of Assistant Director for Communications was created. As the publishing phase of the

Institute waned the communication staff diminished from six to three (fulltime equivalents). This group was concerned with information distribution, data base development and with enhancing awareness of Institute resources. The title of Assistant Director for Communications has been eliminated. A restructuring of the communications/information functions of the Institute is underway following a study of needs and functions. About 1.5 FTE persons are currently involved in the assembling and distribution of research publications.

Table C2. Requests for Technical Publications - New York Sea Grant Institute

	1979	1980	1981	1982	1983
Number of Requests	1550	2100	1119	1400	975
for					
Number of Publications	3200	3900	3137	3500	2204

**Institute Information System:** The State University Research Foundation had developed a computer network among the SUNY campuses for sponsored research management. When Sea Grant qualified for a terminal (on the basis of dollar amount of award) linking it to the system, it gained the opportunity for broadening its information handling capability. Work commenced on developing a data base composed of the Form 90-2 research summary, and a bibliographic file including abstract and certain management information on publications and their distribution. Later, as the software base for that system became obsolete and as microcomputers came into general use, the Institute converted to its present Omnibus System which produced much of the data compiled in this volume. It links Research Progress files, limited bibliographic information and student files with financial information (carried still on the SUNY Research Foundation system) through account codes. Paper files documenting the activities of the Institute are the project grant jacket files and a "Mint File" of all reports and publications. The New York Sea Grant Institute's initiatives in developing an information system are often credited as the stimulus for the development of the national SGNET system.

**Productivity of the Program:** The bibliographic file of the New York Sea Grant's Omnibus System contains 265 entries in the category "reprints", a designator used for articles published in journals. There are 181 entries of technical reports published by the Institute or by a campus. Forty-three entries are classified as books, 30 of which are the MESA New York Bight Monographs, the remainder being commercially published volumes. There are 23 entries of "First Impressions" and 31 for popular articles. These numbers are judged to be conservative by a factor of at least 25%. This is based upon recent findings which suggest that many journal articles published before 1978 were not "captured" and that there are substantial omissions from the computer file although the publications are held by the Institute. The majority of those missing are thought to be journal articles. Tracking of publications is a labor-intensive and frustrating activity.

## Communications: Extension

Table C3. Publications Output - New York Sea Grant Program<sup>1</sup>

Kind	1978	1979	1980	1981	1982	1983
Reprints	45	15	40	56	41	50
Research Reports						
Sea Grant Institute	29	24	17	13	17	10
Other publisher	5	0	13	4	10	0
First Impressions	-	-	-	6	16	5
Feature Articles						
(Sea Grant Inst. only)	0	7	5	4	4	5
News Releases	-	-	-	11	0	5

<sup>1</sup>Based on workload data of communications staff rather than on contents of bibliographic file.

**Comparison of Productivity:** Using the data presented above, it may be calculated that a journal article has resulted from each investment of about \$39,000. Adjustment to correct for undercounting results in a figure for the average investment per journal article of about \$23,000. In 1981, Dr. William Graham, National Sea Grant College Program, compared 26 Sea Grant program publication records, ranking institutions comparatively by output of "reprints" and "technical reports" based on Sea Grant Depository holdings. New York ranked 8th in the "reprint" and 6th in the "technical report" categories. Graham also calculated "Total R&T [reprints and technical reports] per \$100,000" in which New York ranked 8th with 2.1 publications per \$100,000. Recalculated today with the same assumptions, that ratio would be 2.8.

### Sea Grant Extension Program Communications

**Extension Communications:** The nature of extension education is such that a broad approach to communications is required. Different subject areas addressed by Extension Specialists have different audiences requiring differing presentation materials. This understanding requires a variety of approaches--written materials alone are inadequate. For example, "how to" types of information are often best captured and conveyed by written materials but "community problem solving" programs are transmitted through a variety of descriptive materials, case study analyses and a lot of personal "hand-holding." The educational products of extension must, accordingly, be viewed in the context of the programs being carried out. Extension communication needs are identified by Extension Specialists, discussed with the appropriate specialist team, and a decision on the best communications approach is made by the team in concert with faculty resources and leadership. Once the approach has been determined, responsibilities are assigned and guidance is sought from Media Services at Cornell. Media Services, a unit within Cornell's College of Agriculture and Life Sciences, now has a major role in Extension Communications, replacing former communications staff.

**Extension Outreach Assessment:** Based on a 1981 survey of regional and central office communication efforts, an estimate of total outreach was achieved. Those data are presented in Table C4. This is the most recent of a series of periodic assessments.

**Table C4. Frequency and Reach for Print Media Based on Actual and Estimated Audience Contacts - 1981**

Media	Circulation (in thousands)	Total Issues	Reach (in thousands)
Newsletters			
Coastlines	3.5	6	21
Regional Newsletters	1.9	30	16
External Newsletters	21.5	26	74
Magazines	220.3	-	220
Newspapers	3004.7	160	15758
Publications	15.3	-	15300
<b>TOTAL PRINT MEDIA</b>	<b>3267.2</b>	<b>222</b>	<b>31389</b>

**Extension Publication Productivity:** From 1973 to 1983 the New York Sea Grant Extension Program averaged 17 publications per year, a figure which includes only formal and in-house publications. Innumerable short-lived, modest, field office publications have also been produced. Total volume of the official publications is estimated at more than 350,000 pieces. At present there are four newsletters in addition to Coastlines. Coastlines is intended to introduce a range of subject matter to a broad group. The other newsletters are targeted on specific audiences and present specific technical information and current events in a specific area. Initiation of a newsletter is undertaken in the same fashion as other communication initiatives. Two professional staff must accept responsibility for a newsletter in order to assure continuity. Newsletters are regularly evaluated for their utility and user interests--at least two have been ended as a result of the review process. Coastlines mailing list is revised bi-annually.

**Example Evaluations of Individual Titles:** Publications have various purposes ranging from generating awareness to producing specific behavioral change. Evaluation strategies vary accordingly. Three anecdotes exemplify this:

A fact sheet entitled "Promoting Coastal Tourism through Vacation Packages" was produced in hopes that individual tourism businesses would begin to pool their resources in attracting new clients. About one year after initial distribution, a random sample of 30 recipients was drawn from which 22 completed questionnaires were obtained. Of those, 5 respondents indicated they had actually initiated packaging for their businesses. Projecting to the total distribution of approximately 1500 copies, as many as 340 businesses may have explored packaging as a result of information obtained in the publication.

## Communications: Extension

For about one year starting in September 1976, there was a ban on possession of large salmonids from Lake Ontario due to chemical contamination. The exception was that a limited number of individual fish could be kept for trophy purposes. Feeling that the expense of professionally produced trophies would be a barrier for many anglers, Sea Grant produced "Make Your Own Fish Trophy" and distributed about 2000 copies during the possession ban. Responses from 31 recipients of a follow-up survey (out of 50 mailed) indicated that about three quarters had increased interest in trophy fishing and about one tenth indicated they had actually increased their fishing effort as a result.

Many publications have the targeted purpose of providing explicit technical information to enhance decisionmaking, often with clear economic implications. Evaluation of a technical bulletin on floating tire breakwaters (completed by 80 of 140 survey recipients) indicated more than \$500,000 in savings from reduced wave damage and from estimated costs for conventional wave protection. Perhaps as significantly, one quarter of the respondents indicated they had decided against building an FTB, saving additional dollars.

Awareness-generating publications are perhaps most difficult to assess since the audience is diffuse and often not traceable and impacts are difficult to separate from other information sources. A good example would be the "Recreation Climate" series produced jointly with the National Ocean Data Center and covering our Lake Erie, Lake Ontario and Eastern Long Island coasts. More than 15,000 copies of these guides have been distributed. Our evidence of impact relies on anecdotal assessments from Chambers of Commerce and tourism business groups who attest to their utility and on an indirect indication of recipient satisfaction represented by the regular stream of requests received with virtually no maintenance publicity.

The "Lake Ontario Sportfishing Annual" serves the dual role of providing comprehensive information on lake resources and raising funds for our educational activities through sponsor advertisements. In both 1983 and 1984, more than 30,000 copies were distributed. Sponsorship generated more than \$15,000 net in support of sportfishery-related educational programs.

We have made no attempt to assess all of our publication products. However, we feel that targeted assessments as illustrated above demonstrate that our relatively modest extension program publication investment (about \$13,000 annually in Sea Grant dollars) provides an important dimension of our overall extension effort.

**Extension Communications Staff:** The communications function is distributed across the professional staff of Sea Grant Extension. One or more outreach approaches are normally used in an educational program. The selection is based upon the subject, the situation, and the skills of individuals. Thus while one specialist with writing talents may utilize weekly newspaper columns and frequent news releases, another may utilize major electronic media such as commercial radio and television features. Some Extension Specialists may produce formal teaching materials, both audio-visual and/or written, while others will utilize such materials, produced by themselves or others, in a demonstration. In its earliest phases, Sea Grant Extension employed Communications Specialists who were technique oriented and who worked with Extension Specialists in developing skills. That educational function has now largely been passed to Media Services and expertise is lodged with the field staff. Communications staff of the Extension Program was never more than 1.0



Communications: Extension

FTE, and is now 0.75 FTE. That person is concerned with distribution of publications and with production assistance in Coastlines.

**THE SEA GRANT INSTITUTE  
AND  
THE OUTSIDE WORLD**

## The Sea Grant Institute and the Outside World

### Relationships of the Sea Grant Institute and the Campuses

**The Multi-Campus Problem:** Because the New York Sea Grant Institute is a part of the university community, it would be expected to be involved in the affairs of the university. Yet the Institute is physically separate from any single campus and is shared by a private institution and a state university system--both factors which isolate the Institute and its staff from day-to-day faculty involvements. How has this structural relationship affected relationships of the Institute and the campuses? Has the multi-institutional experiment that New York Sea Grant commenced been successful?

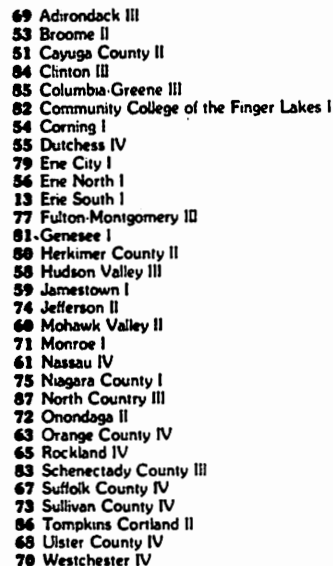
To address these questions, two approaches have been taken: 1) data exhibiting the relationships of the campuses and the Institute have been examined for trends and patterns--the findings are discussed; 2) a study commissioned by the Board of Governors on the question of "institutionalization of Sea Grant in New York" has been undertaken. A summary of its findings will be available separately from this document.

**Setting:** With an enrollment of over 380,000 students and faculty numbering approximately 13,500, the State University of New York is the largest public higher education system in the country. It is composed of four university centers (Albany, Binghamton, Buffalo and Stony Brook), 13 colleges of arts and science, 10 specialized colleges, 4 centers for the health sciences, 6 agricultural and technical colleges and 29 community colleges. The system was designed so that the many, relatively small, campuses were within reach of all the state. SUNY is a newcomer to the state university system, having been founded in 1948. See Figure W1 for the location of SUNY campuses across New York State. The only region not served by SUNY is New York City--home of City University of New York whose 14 campuses comprise the third largest public system (after the University of California).

Cornell University, a private institution, consistently ranks among the top ten academic institutions in the nation. It is a complete university with colleges of Arts and Science, Engineering, Law, Architecture, Business and Hotel Administration, comprising the endowed colleges and the Colleges of Agriculture and Life Sciences, Human Ecology, Industrial and Labor Relations and Veterinary Medicine being the statutory colleges--meaning that they are supported by state appropriations. Although Cornell's enrollment is small, about 18,000 students, its research and graduate education competency is enormous. The College of Agriculture and Life Sciences graduates more PhD's each year than any of the SUNY university centers. Cornell has approximately 1500 faculty.

Sponsored research at SUNY is administered by The Research Foundation of State University. Sponsored research within the SUNY system is about \$130 million per year. Cornell's Office of Sponsored Research administers its grants and contracts: volume of grants and contracts at Cornell is about \$160 million annually.

**Figure W1. Map of State University of New York Campuses**



**Background:** The New York Sea Grant program commenced as an integral part of the SUNY at Stony Brook campus -- the director was also director of the Marine Sciences Research Center. Stony Brook was a vigorously growing part of the State University of New York system and a campus widely perceived by the other SUNY campuses as being favored at their cost. This perception was transferred to the Sea Grant program. Upstate campuses believed that the Great Lakes would be unfairly treated and would receive a lesser share of research funding. When distressed Presidents of upstate campuses expressed this concern to the Chancellor of State University, the decision to move the program from Stony Brook to neutral ground was taken. The choice of Albany was based on the idea that this location would enhance the statewide work of Sea Grant. The program, and later the Institute, has been attached to the Central Administration, SUNY (a separate unit from the State University campus at Albany) for administrative support, but has been separately housed. Several proposals to re-affiliate the Institute with a campus have been put forward but have been rejected on the "fairness" issue. Idealized relationships between Institute staff and academic functions are shown in Figure W2.

**Participation in Sea Grant:** Participation may be measured in many ways. One measure is the number of projects sponsored at the various campuses. The distribution of Sea Grant sponsored projects by campus through 1984 is shown in Tables W1 and W2. Table W1 shows the distribution of projects at the colleges of Cornell and State University of New York. Table W2 shows the distribution of projects among other campuses both in and out of New York State. These counts of projects include all those activities which have been assigned a project number including research, extension, and education and are assigned to the campus of the principal or co-principal investigators. Not included are those projects for which Sea Grant Institute personnel serve as principal investigator. Data presented reveal three stages of campus participation in Sea Grant:

- o The first stage, from 1971 through 1975, is one of broad State University representation in Sea Grant activities. During this period the Institute was encouraged by SUNY to develop broad participation, particularly by the university colleges.

- o From 1975 through 1980, the Institute became less involved with the State University Colleges, sponsoring activities at a broadening circle of other, non-SUNY/Cornell, institutions. At the same time, Cornell's participation substantially increased, and because the budgetary "pie" was growing, there was not a commensurate decrease in participation by SUNY university centers. Support gained from other sources such as State agencies broadened opportunities to participate in Sea Grant activities during this time. SUNY campuses, particularly Stony Brook, were the principle beneficiaries of these projects including Aggregate Mining and the Great South Bay Study.

- o Since 1980, there has been a shrinkage in non-SUNY/Cornell participation and in the total number of campuses involved--in 1984 there are as few participants as when the program commenced--despite total program expenditures being nearly three times the size. Costs of projects are increasing because of increased indirect cost rates and inflation while the total budget remains the same. The result is retraction, and retraction tends to bring the program back to core activity areas. These core areas might be best defined as those subjects the principle participants do best.



Relationships: With Campuses

Table W1. Distribution of Sea Grant Projects among SUNY and Cornell Campuses

	71-72	72-73	73-74	74-75	75-76	76-77	77-78	79	80	81	82	83	84
Cornell-Endowed	1	1	-	-	-	1	4	1	4	2	3	2	2
Cornell-CALS	2	3	7	8	6	9	10	16	13	11	10	9	8
Cornell-Vet & HE	-	1	1	3	3	4	5	2	2	2	-	2	1
TOTAL CORNELL	3	5	8	11	9	14	19	19	19	15	13	13	11
SUNY Albany	3	2	4	3	3	2	2	-	-	-	1	1	1
SUNY Binghamton	2	1	1	-	1	-	-	-	1	1	-	1	-
SUNY Buffalo	4	4	5	3	3	5	7	5	4	2	4	6	2
SUNY Stony Brook	4	7	5	2	5	4	11	8	11	14	6	12	9
SUNY CESF	-	2	3	4	2	1	1	-	-	-	1	3	2
SUC Brockport	1	-	-	1	-	-	-	-	-	1	1	1	-
SUC Buffalo		2	-	-	-	-	-	-	-	1	1	-	-
SUC Cortland	1	1	1	1	-	-	-	-	-	-	-	-	-
SUC Oswego	4	1	2	1	-	-	-	1	4	1	1	2	2
SUC Potsdam	-	-	1	-	-	-	-	1	-	1	1	-	-
SUC Fredonia		2	1	1	-	1	-	1	1	-	1	-	-
SUC Maritime	2	-	-	-	-	-	-	-	-	-	-	-	-
Empire State	-	-	-	-	-	-	-	-	-	-	-	-	-
Suffolk Co. CC	-	-	-	-	-	-	-	-	-	-	-	-	-
Jefferson Co. CC	-	-	-	-	-	-	1	-	-	-	-	-	-
Farmingdale A&T	-	-	-	-	-	-	-	-	-	-	1	-	1
TOTAL SUNY	21	22	23	16	14	13	22	16	21	21	18	26	17

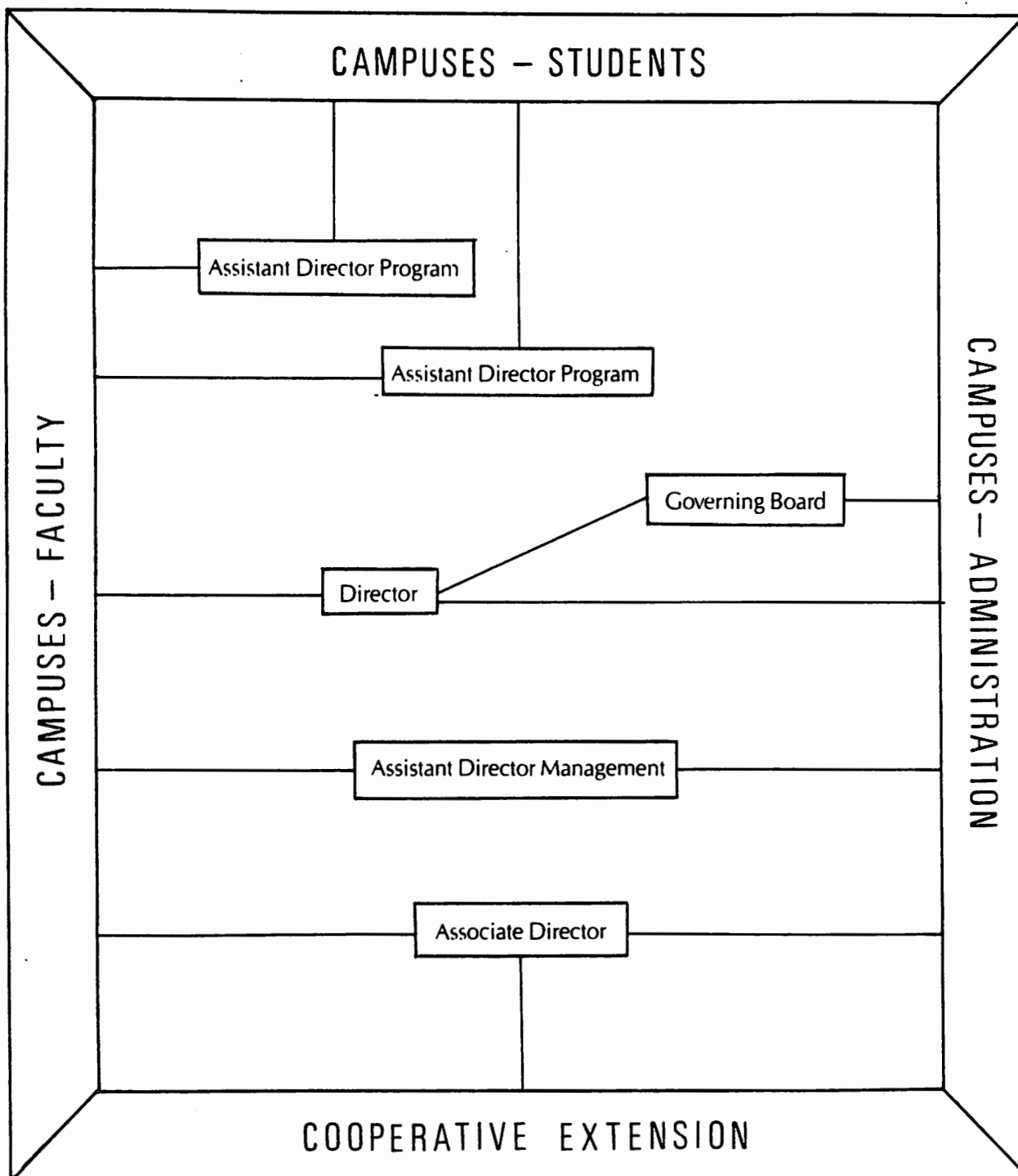
(CALS = College of Agriculture and Life Sciences; Vet = College of Veterinary Medicine; HE = College of Human Ecology; CESF = College of Environmental Science and Forestry; CC = Community College; A&T = Agricultural and Technical College)

Table W2. Distribution of Sea Grant Projects among non-SUNY/Cornell  
Institutions

New York University	-	-	-	1	2	1	1	1	1	-	-	-	-	-	-	-
Adelphi College	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-
Rensselaer Poly Inst	-	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-
Pratt Institute	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Columbia University	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-
Dowling College	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Brigham Young Univ.	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-
Univ Rhode Island	-	-	-	-	-	-	-	1	1	1	1	-	-	-	-	-
Univ. Concepcion	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
LIU-Southampton	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Univ. Pennsylvania	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	-
Penn State Univ.	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-
Clarkson College	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-
Iowa State Univ.	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-
Webb Institute	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
Cooper Union	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
CUNY-City College	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Hunter College	-	-	-	-	-	1	-	1	1	1	1	-	-	-	-	-
York College	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Grad Center	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-
Other	-	1	1	1	1	1	2	2	2	1	1	-	-	-	-	-
TOTAL-Non-SUNY/CU	0	1	1	3	5	7	7	10	13	7	6	2	1	-	-	-

Figure W2. Schematic Diagram of Institute Relationships with Campuses

Functional Relationships — Institute with Campuses



**Student Participation:** Another measure of participation is the distribution of Sea Grant Scholar stipends. These have not been displayed on a year by year basis because the award of Scholar support is related to the award of a research project. The data on distribution of research projects and of Scholar awards would thus be parallel. Instead, the distribution of all Scholar awards by campus is shown in Table W3. Here, the award is counted by the individual student supported without regard for the duration of the award (head count).

**Table W3. Distribution of Sea Grant Scholar Awards by Campus, 1972 to Present**

Cornell - Endowed	18
Cornell - CALS	54
Cornell - Vet & HE	3
<b>TOTAL CORNELL</b>	<b>75</b>
SUNY Albany	21
SUNY Binghamton	7
SUNY Buffalo	117*
SUNY Stony Brook	86
SUNY CESF	18
SUC Brockport	1
SUC Buffalo	2
SUC Cortland	1
SUC Oswego	10
SUC Fredonia	4
<b>TOTAL SUNY</b>	<b>267</b>
Other	23
<b>TOTAL-ALL CAMPUSES</b>	<b>365</b>

\* The total for Buffalo is artificially enlarged by the Coastal Law Scholars, many of whom were appointed only for a summer.

## Relationships: With Coastal Regions

### Relationships with the State's Coastal Regions

**The Two-Coastline Problem:** New York is the only Sea Grant program having two coastlines--Pennsylvania is the only other state which could claim this status. This situation brings with it many opportunities and problems. We believe that we have siezed the opportunities--the problems will be now be identified. There is great dissimilarity between the coastal regions of New York: They are economically, socially and politically distinct. The Marine District, which technically includes Long Island, metropolitan New York City and the Hudson estuary northwards to Troy, can be thought of as three regions: Long Island, New York City and the Hudson Valley. None easily admits a relationship to the others. Yet these three subsets of New York state have 81% of the state's coastal population and dominate 85% of the state's economy. The Great Lakes region, with its subsets of the St. Lawrence Valley, eastern and western Ontario, the Niagara Frontier and eastern Erie (actually Appalachia), seems more homogeneous if only through lesser population density. Of course, the big difference to the Sea Grant Institute between the marine and the Great Lakes regions is in the chemistry of the water and all of the dependent differences in biology.

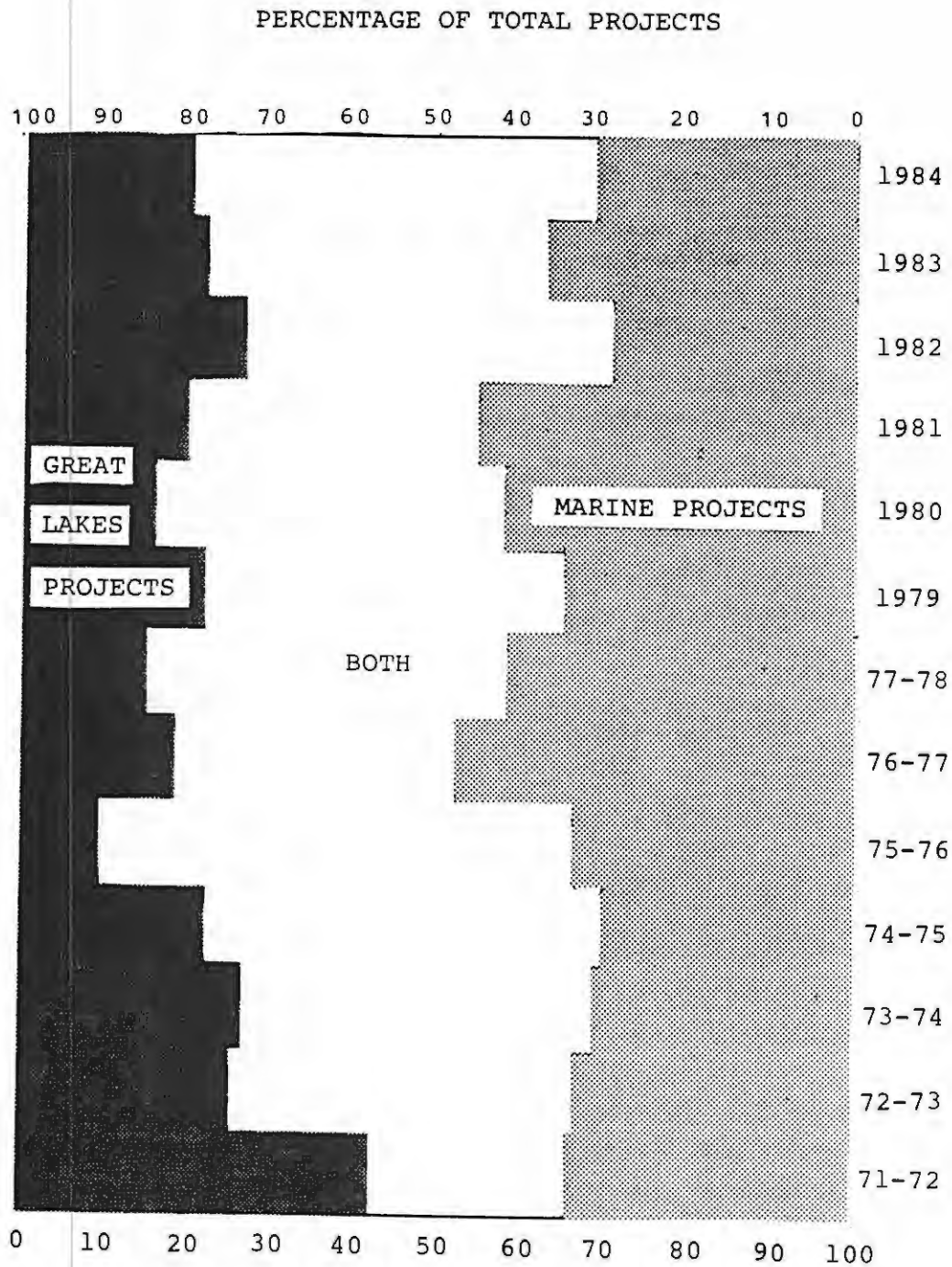
**Distribution of Academic Resources:** A strength brought to Sea Grant by the Cornell/SUNY relationship is the broad array of academic locations possessed by these institutions: Cornell has an extensive number of field stations in the coastal region and, of course, a network of Cooperative Extension Offices. State University's campuses are broadly distributed about the state. But the metropolitan complex is not well served by either--being the domain of City University of New York. While SUNY has six university colleges and one university center immediately on the Great Lakes coastal area, none has developed a strong Great Lakes oriented program--nor has Cornell or any of the inland campuses. And, in the Hudson region, there is only one SUNY university college.

**Sea Grant's Response:** Since the sense of ill-will between the upstate and downstate regions dates from the early 1800's, Sea Grant has sought a neutral position. In essence, there are two programs in the state--one dealing with the marine coast and the other with the Great Lakes. These two programs have different goals, foci, academic resources and respond to different needs. Yet a balance is always sought. Figure W3 displays the numbers of projects dealing with each coastline over the past 13 years.

Relating research needs and the distribution of academic resources has resulted in neglect of some regions. Research in the Hudson Valley and in the metropolitan region is less than might be expected because the region has been the focal point of major programs by the Rockefeller Foundation (in which the Sea Grant Institute participated) and more recently by the Hudson River Foundation, a trust fund formed from funds in an environmental settlement.



Figure W3. Proportions of Sea Grant Projects Assigned to the Marine District, the Great Lakes Region, or Having Relevance to Both. ("Both" includes activities which have actual or potential value to either coast)



## Relationships: With Coastal Regions

**Finer Distinctions in Program Balance:** Research effort is not evenly distributed in any coastal area. New York City receives less attention than does eastern Long Island; Eastern Ontario has had greater attention than eastern Lake Erie. This varied treatment stems from differing opportunities and receptiveness in the regions--the latter characteristic being most important to Extension development. Sea Grant Extension had its earliest and heaviest involvement on the Great Lakes coast. This more rural region was geographically close to Cornell, more closely resembled the land grant college's traditional constituency, and exhibited both need and receptiveness. With time, greater balance between the marine and Great Lakes coast was achieved. Table W4 presents the research and extension foci in the subregions of New York's coastal zone, "averaged" over the last decade.

**Table 4. Research and Extension Foci over the decade in the Subregions of the State, Listed in Order of Priority**

<u>Subregion</u>	<u>Research Emphases</u>	<u>Extension Emphases</u>
Eastern Long Island	Shellfishery Aquaculture Regional Studies Commercial Fishery Energy Coastal Processes Sportfishery	Commercial fishery Coastal Processes Shellfishery Sportfishery Marine Trades Industry Aquaculture
Western Long Island	Recreation Sportfishery Shellfishery Water Quality	Recreation Seafood Technology Sportfishery
Metropolitan Area	Resource Utilization Seafood Technology Marine Trades	Minority Youth Education Consumer Education Seafood Technology
Hudson River	Minor Research	Resource Development
St. Lawrence River	Tourism Sportfishery	Tourism Recreation Sportfishery
Eastern Ontario	Sportfishery Water Quality	Tourism Sportfishery
Western Ontario	Sportfishery Coastal Processes	Sportfishery Coastal Processes Marine Trades
Niagara Frontier	Coastal Processes Sportfishery	Youth Education Recreation Coastal Processes

The Sea Grant Institute and the Sea Grant Community

Members of New York Sea Grant have been active in Sea Grant affairs at a national and regional level. The following listing is not intended to be a comprehensive catalogue of these activities, but rather is meant to suggest the scope of New York's contributions.

Council of Sea Grant Directors: Squires is an active participant in the affairs of the Council, serving on many of its committees. As one of its first chairmen, during its formative period, he assisted it in becoming an active force. He chairs the standing committee on education which has undertaken and published reports on Sea Grant graduates. New York Sea Grant stimulated the development of the SGNET system, as indicated in the following Blue Pages. Wise has been a member of the User Committee of SGNET since its formation. New York has hosted Council meetings.

Sea Grant Association: Squires chaired the committee of the Association which led it to join the National Association of State Universities and Land Grant Colleges. He serves on many Association and Marine Division committees, including the Budget Committee for which he has prepared comparative analyses of federal ocean budgets. Wilkins was President of the Association in 1978-1979, during which period NASULGC/SGA hired its first full-time staff and presented first testimony to the Congress. He chairs the Advisory Service Council and serves on many committees of the Association and the Marine Division. One-time Financial Assistant Suzanne Servis organized the first meeting of Financial Managers of Sea Grant programs under the aegis of the Association. That group meets annually. DeYoung chairs the Committee on Exchange of Extension Personnel within the Association. New York co-sponsored the northeastern Sea Grant Association meeting.

Regional Bodies: New York has consistently urged regional programming and has provided leadership in the development of regional bodies such as the Great Lakes Network, the Northeast Marine Advisory Council and the Sea Grant Mid-Atlantic Marine Advisory Service and meetings of Sea Grant directors in these regions. One accomplishment of such leadership was the development of the northeastern regional tourism research project commenced in 1984. Involvement in regional activities is broad, with Squires, Wilkins, Duttweiler and DeYoung all having served as chair of regional groups in addition to providing general leadership through regular participation.