New York Sea Grant Institute Annual Report, 1986

The State University of New York
and Cornell University, June 1987

A Continuum of Excellence

Dear Friends:

Like everyone else who rigorously evaluated the accomplishments of the New York Sea Grant Institute (NYSGI) in 1986, I was enormously impressed by the organization's productivity and diversity. The report presented here will give you some idea of why this was true.

The Institute was created in 1974 to bring the resources of our state's colleges and universities to bear on the problems affecting New York's 2,400 miles of Great Lakes and marine coastline. One of the largest of the 29 state organizations that comprise the National Sea Grant College Program, the Institute was designated the Sea Grant College of New York in 1975 by the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce.

Between 1974 and 1986, NYSGI supported nearly $40 million in research, education, and extension programs to promote the wise use and conservation of our state and national aquatic resources. These federal, state and private funds have created and sustained programs that are consistently ranked among the best in the nation.

The Institute's extraordinary effectiveness clearly is due to those who preceded me: Director Donald Squires and Acting Directors William Wise, Ronald Scrudato and Bruce Wilkins. Their skill, imagination, and energy are in evidence throughout this program. As Director of NYSGI since January, 1987, it is my goal to maintain and extend the continuum of excellence that they created.

The report that follows is intended to provide the reader with highlights of the 1986 program. I hope that you will also get from it an idea of how the Institute pursues its goals by bringing relevant knowledge to consumers, youths, shoreline property owners, business persons, and all who live, work, and play on New York's coasts.

Cordially,

Robert E. Malouf

Robert E. Malouf, Ph.D., Director
June, 1987

Helping Our Coastal Industries Build Solid Economic Foundations

Owners of commercial fishing operations and recreation- and tourism-related businesses have over a billion-dollar impact on New York's coastal economies each year. These enterprises have an ongoing need for a reliable source of management training and leadership development, as well as for up-to-date information on the latest trends and technologies in their trade.

The New York Sea Grant Institute offered a variety of programs, research efforts and services to meet these needs in 1986.

AIDING MARINA OWNERS

The marina industry employs thousands of people in our state, yet suffers from a shortage of qualified personnel. This is in part due to the lack of formal training programs designed to improve the skills of current and prospective employees.

To help rectify this situation, a Sea Grant specialist worked with industry leaders and a Sea Grant professor at the State University of New York's Agricultural and Technical College at Farmingdale to develop a two-day short course on advanced marine engine repair and maintenance for marina personnel.

The course, taught by SUNY faculty using marine equipment and a boat donated by the industry, attracted 30 marina employees. Evaluations showed those attending gained valuable practical experience.

One marina owner who participated in the course has since begun recruiting on campus, and has already hired one recent course graduate to work in his business.

Sea Grant also assisted the college administration in carrying out a regional survey of marine industry training and education needs. Based on the results of this survey, the College at Farmingdale hopes to develop a curriculum that will help provide qualified personnel for this growing industry.

A Sea Grant-sponsored "Marine Industry Management Training Series" provided an array of workshops addressing the educational needs of marine recreation businesses.

More than 350 recreation-oriented marine business owners and operators participated in this business management training. In evaluating the program, participants said they felt that it was of such value that it should be repeated, and expanded, in future years.

They are keenly aware that they will need to understand the latest in technology, business management techniques, and issues, to maximize their potential success.

Computers can play a major role in marine businesses, as in so many others. Recognizing this, Sea Grant extension agents in the Great Lakes area organized a day-long workshop for marina owners, on spreadsheet applications for their businesses. More than 20 attendees, with marinas on Lake Ontario and the St. Lawrence River, learned how to be better managers by using computers more effectively in their trade.

The complexity of issues surrounding the operation of marine recreational facilities in sensitive coastal areas often makes it difficult for public officials to formulate sound regulations for these enterprises. Such was the case when members of a county legislature, concerned about pollution from boats, proposed a law requiring boat sewage pumpout stations at every marina.

Working with the legislators, industry leaders and others, Sea Grant initiated a survey of the usage of existing facilities and developed technical information on the boat pollution problem. The results of this work indicated that boaters were not using the available pumpout facilities, and that installation of new facilities as required by the proposed law would cost $2 million.

It was also shown that new facilities would have little, if any, effect on the pollution problem the law was intended to correct.

Consequently, the legislature withdrew the bill, and began using the information to develop a more effective solution.

INVOLVEMENT IN SPORTFISHERY MANAGEMENT AND POLICY

Sea Grant helped the New York Sportfishing Federation, an umbrella political action organization representing more than

40,000 anglers, to reorganize and redirect their eforts more effectively.

Federation leaders had determined that the group was no longer making significant progress toward its goals. They turned to Sea Grant for help.

Sea Grant facilitated their meeting with the executive director of the Gulf Coast Conservators Council, a large, influential group with similar goals, based in Texas. Through this meeting, and the sharing of information it produced, the leadership was able to reorganize the Federation, resulting in increased membership, higher income, and greater impact.

Sea Grant also aided the Federation leaders by providing them with current information on new technology and issues related to marine angling. This was achieved by Sea Grant personnel developing a day-long seminar called the "New York Sportfishing Forum," which was attended by more than 400 sportfishing leaders. They, in turn, transferred the information gained at the Forum to their organizations' members.

This sportfishing technology transfer program thus ultimately helped some 40,000 organized anglers.

In the Great Lakes area, two surveys conducted by Sea Grant extension specialists bystematically determined the economic effects of major competitive fishing events on local communities.

On Lake Erie, the results were used by the City of Dunkirk to help establish launch fees at the city marina, and by a county fishery board and a state assemblymember's office to support improved access to the lake.

On Lake Ontario, the results enabled decision-makers in seven counties to track the flow and growth of fishery-based revenues in their areas over the past eight years, and prompted one county board to call for increased planning and promotion.

Sea Grant funded research by an economist at SUNY at Oswego, who investigated the economic effects of sportfishing on the communities in the Salmon River corridor. The findings were used by the U.S. Army Corps of Engineers to help establish a funding formula for construction of a major harbor-of-refuge project.

The information also was used by the two largest chambers of commerce in Oswego County in justifying, funding and directing their fishery promotion and marketing efforts, and by four lodging establishments in their expansion plans.

Sea Grant also played a role in the state's decision to review its sport-caught fish consumption advisory approach. Extension staff discussed the matter with State Department of Environmental Conservation staff, and provided them with field perspectives on how anglers inquire and react on the issue.

Extension personnel also provided the state with information and faculty contacts with expertise on the issue of fish oil in the diet--a variable in the consumption-advisory equation that has yet to be addressed fully.

Another Sea Grant-sponsored research project revealed successful lake trout reproduction in Lake Ontario for the first time in many years. Extension staff used the news media to relay this exciting development to angling audiences, and helped reduce scepticism over the feasibility of the international rehabilitation efforts that had been going on in the lake.

In addition, a Sea Grant specialist received a grant from the U.S. Fish and Wildlife Service's fishery extension program, to produce a flyer explaining how best to release caught fish so as to maximize their chances for survival.

The draft text and educational approach of the flyer was praised by the State Fisheries Bureau, disseminated to key audiences and media, and incorporated into deliberations on the need for more restrictive creel limits on lake trout.

A Sea Grant-supported assessment of the commercial harvest of emerald shiner from the Niagara River indicated that it was a major source of baitfish for anglers, and represented a multi-million-dollar industry.

This first-ever indication of the magnitude of the harvest was conveyed by Sea Grant extension personnel to the State Fisheries Bureau, resulting in heightened concern over the exploitation of the shiner, its effect on important predator species, and the need to increase the baitfish population by methods including aquaculture.

A Sea Grant extension proposal to test-market a new and potentially superior baitfish, the killifish, is awaiting review by the Great Lakes Fishery Commission.

Sea Grant sponsored a research project on refining walleye pond culture, and first-year results enabled extension staff to hold two informational meetings on raising fingerlings for stocking in Lake Ontario embayments.

The meetings resulted in two private organizations taking steps to improve existing walleye culture procedures, and prompted two new groups to commit to pond culture projects for stocking walleye in local waters.

These meetings also improved communications between these groups and the

State Fisheries Bureau on walleye culture initiatives. One result is that the proposed stocking efforts will adhere to a new statewide walleye enhancement plan.

BUILDING COASTAL TOURISM

Sea Grant extension and research divisions in 1986 expanded services and programs for tourism-related businesses in both the Great Lakes and marine districts.

Educational and technical assistance was provided to the burgeoning bed-and-breakfast industry in the Great Lakes, for example, by holding some 15 workshops in 5 counties. These were attended by more than 300 business owners, employees, and prospective business persons.

Sea Grant also addressed community and county leaders and officials on tourism-related topics, and co-sponsored several other programs designed to promote, sustain and increase coastal tourism.

For example, 62 lodging business owners participated in workshops on financial and marketing management. Attendees reported that the workshops were useful in improving their skills as business managers.

Also, 51 tourism-related business owners participated in workshops on market planning, advertising, and brochure development. Afterwards, 12 businesses requested critiques of their brochures or marketing plans, and implemented appropriate changes.

And more than 70 people attended a seminar on the public facility development plans and private business opportunities near the Port Ontario Harbor of Refuge. Attendees indicated that they had not previously understood the complex agency interactions involved in this project, and that the seminar helped clarify their business decision-making.

On Long Island, the New York State Department of Commerce asked Sea Grant to work with business leaders draw up economic development recommendations relating to tourism. As a result of Sea Grant's input, three of the six tourism recommendations were sportfishing-related. The recommended projects will be reviewed by the Department of Commerce for funding to stimulate economic development on Long Island.

REVITALIZING COMMERCIAL FISHERIES

Bay scallops in Long Island's waters were once a million-dollar-a-year business. But in two successive years, 1985 and 1986, a mysterious brown algae bloom killed off millions of scallops, and all but destroyed that industry.

Sea Grant, in conjunction with the Suffolk County Cooperative Extension Association Marine Program (SCCEAMP), coordinated two major bay scallop reseeding projects in 1986. The two projects are the Long Island Green Seal Committee project and the Town of Southold project, which also involves researching the feasibility of innovative nursery system design.

Between the two, some 1.5 million scallops have been placed into prepared bottom waters of the Peconic Bay system.

Also, to help commercial fishers, Sea Grant and SCCEAMP established a new bi-monthly publication, "On the Water." Received by 4,000 people involved in commercial fishing in Suffolk County, "On the Water" covers events, issues, trends and technologies that are most important to people in that trade today.

The publication was started with a grant from the New York State Department of Agriculture and Markets, and continues through the financial support of commercial industry suppliers.

Sea Grant also helped coordinate two programs directed at assisting displaced commercial striped bass fishers.

The first is a loan program that provides between $5,000 and $25,000 at an interest rate of 3% over a maximum of seven years. During 1986, $350,000 worth of loan requests were made by striped bass fishers assisted by extension agents.

The second program provides coordination for five "alternative fisheries workshops" for displaced striped bass fishers. These workshops are scheduled for completion in 1987. This program also involves ongoing monitoring activities.

Sea Grant assisted a group of 10 commercial fishers in Montauk, Long Island, in establishing Inlet Seafoods, an organization that is now packing out and marketing their own member boat products. They have instituted a full pack-out service including fuel and ice but, more importantly, they are now also taking an active role in marketing their catch, which will likely result in higher dockside prices.

Sea Grant also helped develop a proposal with Inlet Seafoods, seeking funds for the establishment of a barge containing a freezer and refrigeration unit. The grant was awarded, and the barge is presently being used to support the creation of a bait fishery from underutilized or normally discarded species.

This, in turn, is helping to create new marketing opportunities in the fresh market.

GROWING FISH, GROWING SKILLS, GROWING PROFITS

Aquaculture is the controlled cultivation of aquatic plants and animals. Recent disasters in the natural fisheries of New York State (described elsewhere in this report) made the promotion and development of aquaculture, already a top priority of New York Sea Grant Institute, an even more vital activity.

In 1986, Sea Grant sponsored five major aquaculture research programs--three on Long Island, one in the Great Lakes area, and one international project in Baja California, Mexico.

At the State University of New York at Stony Brook, Dr. Scott Siddall studied factors influencing the settlement, metamorphosis, and early post-larval survival of bay scallops, while Dr. Carmela Cuomo did similar work on another shellfish, the soft clam.

Based on their investigations, scientists may one day be able to determine the factors that promote the survival of these scallops and clams. This work, of course, is of great importance to aquaculturists, as they attempt to increase the amount of shellfish available to the seafood-consuming public.

Another Sea Grant-sponsored aquaculture project was that of Dr. Joseph Buttner of the State University of New York College at Brockport. In 1986, Dr. Buttner began developing a system to manipulate zooplankton populations and culture walleye fingerlings in ponds. This work could have tremendous ramifications, since walleye is an important game and table fish that is growing in popularity with anglers and consumers.

The fourth aquaculture project was that of Drs. Glenn R. Lopez and Robert E. Malouf at the State University of New York at Stony Brook. They began work to determine the mechanisms governing the growth of suspension-feeding bivalves in coastal waters. By helping aquaculturists to understand why some areas are good for shellfish growth and some aren't, this work will aid them in selecting the best locations for their facilities.

The final aquaculture project was conducted by Dr. Boudewijn Brinkhuis of the State University of New York at Stony Brook, in the waters off Baja California, Mexico. He was working to determine what environmental factors regulate seasonal growth dynamics in a valuable red seaweed that occurs there.

New York Sea Grant's extension personnel were just as busy as the researchers in 1986, in the area of aquaculture.

In the section on "Kids and the Coasts" elsewhere in this report, there is a description of the successful experiences that 4-H Club members had with Sea Grant help in 1986, culturing blue mussels in Long Island and bullheads in Monroe County. Other Sea Grant-assisted projects included the culturing of some 90,000 hard-shelled clams in Riverhead, and 24,000 more in Stony Brook Harbor.

From these experiences, it became apparent that many youngsters in New York State are interested in participating in applied aquaculture projects. In addition, the projects received strong support from local governments and communities, and that shouldn't be surprising.

After all, these young people may well become future leaders of the growing business of aquaculture in New York State.

THE CHARTERBOAT INDUSTRY

Like marinas, sportfishing charterboats are big business in New York State. An estimated 750 charter fishing operations do business on New York's marine and Great Lakes coastlines. People of all social and economic levels enjoy going out to spend a day on the water.

To help this business realize its full potential, a Sea Grant specialist conducted a survey of the charter boat industry in 1986. He found that charter operations valued at approximately $18 million (capital investment) were likely having an annual economic impact of about $10 million in the region.

Information gained from this survey was also used by the U.S. Army Corps of Engineers to forecast the potential benefits of a channel enhancement project at Sandy Pond.

A local town used the information, too, to determine the economic benefits that might result from a channel dredging project.

And the charter industry itself used the survey results to document its economic importance in at least two lakeshore counties.

On Long Island, sportfishing boat activities traditionally have not adequately been recongnized as a major tourism resource by state and regional tourism agencies.

In 1986, Sea Grant brought together representatives of the nine major charter, party and rental boat associations, the New York State Department of Environmental Conservation, and the executive staff of the Long Island Tourism and Convention Commission (LITCC). The purpose was to discuss ways to improve promotion of marine sportfishing opportunities in New York.

As a result of this meeting, Sea Grant

received support from the associations and from the LITCC to produce a sportfishing promotional publication that emphasized charter, party and rental boat sportfishing opportunities in New York's marine waters.

Seventy thousand copies of this publication are now being distributed by the LITCC.

Related to this activity is the research supported by Sea Grant to determine the economic impact of the Long Island fishery.

Dr. James Kahn, of the Department of Economics at the State University of New York at Binghamton, is ocnducting this research, scheduled for completion in 1988. He trained students who conducted over 2,000 interviews with Long island party and charterboat fishers, regarding expenditures and other information. Using this data, Dr. Kahn will develop a model for valuing this fishery.

Preliminary findings indicate that the average recreational angler spends $845 during 13 fishing trips off Long Island each year.

The ability to put a dollar value on the Long Island sportfishery should help state and regional planning and tourist agencies, as well as the industry itself.

Sea Grant communicated directly with more than 400 charter operators in 1986, through the newsletter "Charterlines." Supported by seven Great Lakes area charter fishing asociations, this publication in cluded information on such atopics as fishing tournaments, lake levels, boat shows, fishing techniques, the numbers and condition of various types of fish in the lakes at different times of year, and pertinent laws, rules and regulations.

"Charterlines" was also used to convey the findings of relevant Sea Grant-funded research projects. For example, Dr. Stephen Brandt, a Sea Grant Professor of Lake Ontario Fisheries Dynamics at the SUNY Colleges at Oswego and Syracuse, found that as the lake's salmon and trout mature, they change their preferences in water temperature, depth, and food.

By passing this information along, Sea Grant performed a valuable service for its charter-operator readers.

Also in 1986, a New York Sea Grant specialist organized and chaired a workshop that documented, for the first time, the size, nature, and organization of the Great Lakes charter industry, and the business education applications available to Sea Grant personnel for use with the charter-operator audience.

And finally, in early 1986, Sea Grant relinquished its one-year, organizational support role with the New York Charter Sportfishing Council, a private consortium of charter trade organizations. By year's end, the Council had established its own clerical support mechanism, and had adopted by-laws, taken in a new, seventh member group, and forged a united response to a critical fishery management issue involving the harvest of lake trout.

In other words, the group was on its own, influencing the livelihoods of 400 charter operators, and making critical input into the state's fishery management policies.

In these and other ways, New York Sea Grant Institute helped facilitate the growth of the state's charterboat industry in 1986.

Dealing with Natural Coastal Forces

Historically, erosion along New York's 2,400-mile shoreline has resulted in recession rates of from one to five feet per year. Short-term and episodic rates can exceed 10 feet per year. A "bad" year of high water levels, storms, and flooding can have tremendous social and economic consequences.

Lake Erie, at about 36 inches above average, equalled or exceeded 20th-century monthly record-high levels during every month of 1986 except April. While Lake Ontario didn't set any records, it was up to 21 inches above its seasonal averages throughout the year.

The high water levels on New York's two Great Lakes accelerated shoreline erosion in the region, but Sea Grant-sponsored activities kept pace with the problem, thereby helping to mitigate its effects.

NYSGI'S extension personnel, noting the rising water levels in January, took a proactive approach. They knew that if the trend continued, the waters would soon threaten docks, marinas, homes, sewage and water treatment plants, boat launches, waterfront restaurants and recreational facilities in the area.

They also knew that many coastal audiences tend to be unaware or misinformed regarding lake level fluctuations, erosion control methods, and sources of information and help.

So, they created a newsletter for marine

facility owners, government officials, news media, coastal landowners' associations, and Cooperative Extension agents.

This publication gives the current water levels for Lakes Erie and Ontario, explains how they got that high, tells how coastal properties might be affected, suggests ways to minimize the impact, and lists sources of information and assistance. As a result, these audiences now have a single, reliable, up-to-date source of information on their erosion problems.

Lake Ontario presents a unique challenge to those concerned with coastal processes. The delicate sand dunes on the eastern shore of the lake are especially vulnerable to erosion, yet their beauty and seclusion attract sometimes-careless picnickers, hikers, joggers and others in dangerously high numbers. Sea Grant is involved in helping to protect this sensitive environment.

In 1985, NYSGI extension personnel played a catalytic role in forming the Ontario Dune Coalition (ODC), an umbrella organization of agencies and user groups concerned with the proper use and management of the last major dune and wetland complex on Lake Ontario.

In 1986, they helped the group to carry out its educational program. A Sea Grant specialist served as chair of the ODC's Education Committee, and provided the expertise and clerical support necessary to complete its work plan.

To help the organization to attain its goal of gathering primary baseline data on the use and users of the dune system, Sea Grant identified and recruited a student through the SUNY College at Oswego summer intern program. The student collected and compiled on-site data and observations from which several significant conclusions could be drawn.

For example, all-terrain vehicle use in the area is minimal; also, the area's visitors are more concerned about recreation than erosion. These facts are contrary to original perceptions, and will be used in developing future educational programs of the coalition, and in producing ODC position papers.

The major concern of the ODC in 1986 was the rising level of Lake Ontario. Sea Grant produced a brochure on the causes and extent of the problem, its possible effects, and some preventive measures that could be taken to mitigate damage due to flooding and erosion caused by the high lake level. This brochure was provided to all residents of the dune area in the spring.

As a followup, a public forum was held. It was attended by more than 60 persons, including representatives from all the landowner associations in the eastern Lake Ontario basin.

Another erosion-related Sea Grant activity involved extension specialists providing State and local government officials with technical assistance.

For example, the Town of Southold, in Long Island, was faced with severe erosion along a stretch of coast that included town, county, and state property. Sea Grant helped develop a strategy to remedy the situation.

Our extension personnel met with the town board, and urged them to establish an advisory committee comprised of government officials and private citizens. This group offered both short- and long-term recommendations on erosion control, which the board adopted.

One of the suggestions was that the board request State assistance. Consequently, representatives from the New York State Department of Environmental Conservation (DEC) were invited to the area. After their visit, DEC stated that it was putting $50,000 in its budget to provide a study on which long-range erosion-control strategies could be based.

In the Great Lakes, also, our extension specialists updated government officials on current water levels and their potential effects, mitigation techniques for flooding and erosion, and the long-range forecast.

A fine example of Sea Grant's positive effect on local erosion-control efforts occurred in Oyster Bay. After attending a Sea Grant-sponsored workshop on erosion, Town officials asked for NYSGI's help in reviewing plans for enhancing public facilities at a heavily-used town beach on the ocean.

Based on Sea Grant's recommendation, the Town reversed a decision to place two structures valued at $200,000 on the beach, and to put them instead in a more protected area behind some sand dunes.

This proved to be a wise decision when winter storms completely eroded the areas first proposed, while the the structures, under construction at the time, were untouched at their new sites.

Long Island-based Sea Grant specialists also spotted inconsistencies in wave information from a consultant for the U.S. Army Corps of Engineers. Based on this erroneous information, a planned dredging project had called for installing a 1,000-foot breakwater to lessen erosion.

After learning of the errors, which were called to their attention by our specialist, the Corps began a study which showed that the breakwater was unnecessary. Savings: $1,000,000. Some other extension activities in 1986 included presenting workshops for

coastal landowners and decision-makers (more than 500 persons attended these). Topics included comparisons between the traditional, "structural" erosion-control methods and newer, biotechnical methods.

Extension personnel also performed inspections of eroding properties. More than 250 persons who requested this service received information on the various mitigation methods for their specific problems.

Erosion and flooding were among the many topics of investigation in Sea Grant's substantial "Coastal Processes" research area in 1986. Other topics included various actions of ice and waves.

For example, Dr. Akio Wake, of the State University of New York at Buffalo, conducted a study of ice dissipation in natural water bodies. Through the development of simplified, practical methods for estimating ice-melt rates, Dr. Wake's work may help improve our ability to forecast the probability and extent of flooding and erosion.

Dr. Philip Liu, of Cornell University, examined the motion of waves in the nearshore zone. The knowledge gained from his study may produce a useful tool in forecasting beach evolution.

And Drs. H.T. Shen and P.D. Yapa, both of Clarkson College of Technology, investigated the hydraulics of hanging ice dams. By increasing our knowledge of how and why these dams occur and investigating alternatives for minimizing their formation, this work may help hydroelectric plants to develop more efficient flow-regulation plans. It may also benefit shipping interests and riverside landowners.

In 1987 and beyond, there is a strong chance that the levels of New York's Great Lakes may equal or exceed those of 1986. If this occurs, the pace of Sea Grant's research and extension activities will no doubt continue to respond in kind, and maybe even set a few records of its own.

Improving Water-Quality Predictions For Businesses on the Great Lakes

Water is a vital resource for New York State's industries. Nowhere is this more true than at the Eastman Kodak Co. in Rochester, one of the nation's biggest corporations and the area's largest employer.

Kodak, which has its own water intake plant on the shore of Lake Ontario, needs high-quality water in the manufacture of its films, papers and chemicals. Any great change in the quality of the lake's water means that Kodak's production processes may have to be adjusted or delayed, or even that some of its products will have to be discarded.

To a lesser extent, the same is true for many other major industries located near Lake Ontario, such as Xerox and Bausch & Lomb, as well as for local municapal power plants, which use the lake's waters for cooling processes.

Recognizing this, New York Sea Grant Extension co-sponsored a bi-national workshop in late 1985, on the topic of the industrial water source quality of Lake Ontario. The workshop helped to explain the effects of the lake's water quality on various industrial and municipal processes.

In 1986, Sea Grant Extension specialists followed up on the workshop by holding meetings with local industry representatives to explain how climate and the weather affect this resource. Our specialists also advised Canadian officials on the same topic.

In addition, Extension personnel came up with the idea for a research project to explore this topic for the benefit of industries in the area. As a result, NYSGI agreed to fund an investigation by a hydrologist and Dr. Ralph Rumer, Director of SUNY at Buffalo's Great Lakes Program.

Dr. Rumer will attempt, in 1987, to develop a methodology to make possible the accurate prediction of changes in lake water quality due to daily and seasonal weather conditions. This research will also be supported by the university and by industries in the Lake Ontario region.

All of this activity represents the first coordinated Sea Grant research and extension effort to look at water as part of the manufacturing process.

Kids and the Coasts

With nearly 4 million school children living in the coastal areas of our state, the Sea Grant strategy for reaching them has always been to "teach the teachers." This has proved to be the most effective way to transmit information to such a large audience.

In 1986, Sea Grant involved school children in exciting new educational efforts, largely by relying on our traditionally close relationship with 4-H agents, teachers, and other individuals and organizations that provide education, leadership, and role models for youth.

One program in particular, which began in the marine district in late 1985, rolled through the state like a tidal wave, creating a major splash in the Great Lakes area in 1986. This was the "Master Anglers" program, in which Sea Grant recruited some 100 adult volunteers to teach coastal topics to kids of ages 5 through 19.

Begun in Long Island, the Sea Grant Master Anglers program provides 13 weeks of training for experienced fishers. Topics include nearshore and offshore fishing techniques, conservation laws and issues, seafood handling, and fisheries management, among others. In addition to classroom instruction, participants are required to write a paper or conduct a project related to some aspect of sportfishing.

The participants may be professionals, such as charterboat operators, or simply amateurs who are excellent fresh or saltwater fishers. But all who are certified as "Master Anglers" by their Sea Grant instructor at the end of the course, pledge to share their knowledge and enthusiasm with the youth of New York State.

Because of our "teach the teachers" philosophy, Master Anglers has proved to be a great leadership development program. Participants include entrepreneurs who aspire to positions as writers or editors of fishing publications; operators of charterboat businesses; instructors of clinics, seminars and workshops on sportfishing; and other positions that will give them the chance to "spread the word" about the fun and profit to be had on the water.

In 1986, Sea Grant-certified Master Anglers provided fishing clinics for 4-H clubs, Scout troops, and school groups. They conducted a fishing cay-camp for kids from low-income families in Niagara County, and hosted an angling program for the handicapped in Long Island. They held a fishing contest for youths in the Great Lakes, and offered advice and instruction at a fishing derby for children in Bellport.

Through these and other efforts, the Master Anglers continued to serve as Sea Grant's goodwill ambassadors to the state's school children. They provided them not only with information, but also with a positive image of sportfishing, and of our organization as a whole.

Master Anglers training sessions were held in Niagara and Suffolk Counties in 1986. And Westchester, Nassau, Columbia, and Oswego Counties, as well as the State of Minesota, have expressed interest in starting similar programs.

Master Anglers wasn't the only activity in which Sea Grant "taught the teachers" in 1986.

An NYSGI Extension specialist spearheaded the organizational efforts of the non-profit Oswego Maritime Foundation to create a sportfishing clinic for youths in the eastern Lake Ontario region. The clinic gave the kids a better understanding of the lake as a recreation resource, and of sportfishing in general.

Sea Grant also initiated a 4-H agents' retreat, to encourage them to see coastal education as a major program area in their dealings with young people. NYSGI considered it a positive step when, also in 1986, two 4-H agents from coastal counties had their job descriptions changed to place more emphasis on lake-related issues.

A three-day "lake camp" for teenagers, organized by Sea Grant years ago, was continued in the summer of '86. The camp, run by 4-H agents with Sea Grant specialists acting as advisers, offered education in such diverse topics as lake history, erosion and pollution, shore-bird identification, and Lake Ontario's fisheries.

The participants also visited a fruit farm, to see how erosion was affecting its operations, and took a tour of Lake Ontario on a charter fishing boat.

The Research component of New York Sea Grant also helped educate students in coastal topics. Sea Grant Principal Investigator Dr. Joseph Buttner, of the State University of New York at Brockport, received an NYSGI "Coastal Issues Small Grant" for the purpose of conducting a project involving cage-reared bullheads. This was the first freshwater aquaculture project for youth ever conducted in the state.

Sea Grant Extension personnel recruited the junior high school students who helped with the experiment.

At Braddock Bay in Lake Ontario, about 20 kids helped capture young bullheads and place them in four 1-cubic-meter cages. All through the summer, directed by Dr. Buttner, a core group of about seven students fed the fish and monitored them for growth and mortality.

With careful record-keeping, they helped the professor in his efforts to discover whether this species can successfuly be "aquacultured"--that is, raised to healthy adulthood under controlled conditions.

The project gave the students a meaningful, hands-on experience in aquaculture, while providing Dr. Buttner with valuable information for his own Sea Grant research.

A similar project was conducted in Long Island in 1986, where Sea Grant Director Dr. Robert Malouf supervised the research component of an experiment in which 4-H youth cultured blue mussels. The educational component was carried out by the Board of Cooperative Educational Services and the Cooperative Extension Association of Suffolk County.

From this brief review, it is clear that the Institute remains committed to youth education and involvement in the coastal issues affecting our state.

Bringing Seafood Information To Consumers and Businesses

The nation's interest in seafood has risen dramatically in recent years, with an increased emphasis on fitness and the discovery that certain fatty acids in fish oil lower cholesterol levels and may help prevent high blood pressure and heart disease.

The average American consumed an average of 14.5 pounds of seafood in 1985, and indications are that the 1986 level rose to 15 pounds. In 1982, the average was 12.3 pounds.

With this trend in mind, Sea Grant's research and extension components both devoted major efforts in 1986 to activities relating to seafood.

In the Marine District, Maria Sant'Angelo updated home economists, dieticians, home health aides, and consumers alike on seafood nutrition, handling, storage and fundamentals of fish cookery. She also spoke to more than 100 members of the Nutrition Council of Greater New York on how fish relates to U.S. dietary guidelines.

And she trained 50 food and nutrition workers in seafood species identification, nutrition, contaminants and preparation.

With funding from the Mid-Atlantic Fisheries Development Foundation, a videotape on techniques for microwave coking of seafood was also developed and shared nationwide.

Her efforts were not devoted exclusively to the ranks of professionals, however; she conducted seafood stir-fry and microwaving demonstrations, and distributed information on seafood to some 50,000 people at various public events on Long Island during the year.

And she taught classes for volunteer group leaders on such topics as how to recognize good seafood quality, how to "stretch" fish by preparing it with extenders, and the proper methods of freezing finfish.

Ms. Sant'Angelo presented programs for young people, too. She conducted programs for about 100 youngsters on seafood nutrition, handling, selection and preparation.

One Sea Grant Extension specialist had noticed that, because of ignorance of proper fish handling techniques, sport-caught fish destined for the home table were often spoiled or low in quality.

So, Ken Gall wrote a 50-page booklet called, "Handling Your Catch: A Guide for Saltwater Anglers." He designed it to help anglers understand and adopt proper fish-handling methods to maximize quality, edible yield, and food value. By year's end, over 1,600 copies had been sold to sport fishers, teachers, fishing clubs, and youth programs.

With this guide, anglers may now develop practices that will significantly reduce the amount of waste associated with recreationally harvested fish.

From earlier Sea Grant-sponsored research, it was known that there is a potential health risk among certain urban ethnic groups associated with the consumption of contaminated

fish from New York City waters. In 1986, extension specialists developed a workshop for paraprofessionals who work with low-income families in the City. The program provided attendees with an understanding of seafood's nutritional benefits, as well as its potential health hazards.

It also gave them information on ways to prepare the fish so as to reduce those hazards.

The aides who were trained later reported that they reached, directly or indirectly, some 10,000 high-risk families with the information gathered at the workshop.

Seafood education efforts proved just as successful along the upper Hudson River as they did in Long Island and New York City.

In fact, Sea Grant Extension co-funded a Seafood Educator agent along with the six shoreline counties of Albany, Columbia, Rensselaer, Greene, Saratoga and Schenectady. This agent, Gail Bromley, developed a questionnaire for supermarket fish managers, through which she determined that the markets' biggest fish-related problems are that consumers don't know how to prepare a wide variety of fish, and that the supply of fish to the stores is unpredictable.

Price Chopper, one of the biggest supermarket chains in the area, followed up on Ms. Bromley's questionnaire with in-store surveys of their customers, and found that their top three concerns are price, freshness, and ignorance of how to prepare the various types of fish the stores offer.

Price Chopper then asked Ms. Bromley to train its fish managers so that they could better address their customers' concerns.

In response, she created two videotapes; one on shellfish and one on finfish. They both cover such topics as preparation; nutrition (including sodium and fat content); how to determine freshness; and cost comparisons, both with red meat and with the different types of fish.

The video training programs, along with supplemental written information, were slated to be presented to all Price Chopper fish managers before the 1987 Lenten season, which is the the biggest fish-eating time of year.

Much of what the extension personnel were teaching about seafood nutrition in 1986 came from information developed by New York Sea Grant-funded researchers. For example, Drs. John E. Kinsella and John B. German, both of Cornell University, began work in 1986 on a 2-year study to determine the specific therapeutic effects of the fatty acids in fish and fish oil.

Their efforts will focus on improving methods of isolating, concentrating, and purifying such acids, and on clarifying the biochemical processes involved in their stability and shelflife.

This research has obvious implications for the pharmaceutical industry, which may be able to produce and market therapeutic fish-oil products on a large scale when definitive answers are found to the questions Drs. Kinsella and German are investigating.

Dr. Joe Regenstein, also of Cornell University, is working on another problem relating to seafood: how to maintain the quality of fresh and frozen finfish. His work is aimed at developing methods that will improve the shelflife of fish (always known as a delicate item); devising new methods for more accurately predicting the shelflife of fresh fish; and developing a way to improve the storage characteristics of minced fish products.

This project may one day lead to greater marketability of fresh seafood, and open the door to expanded uses for minced fish.

Jars of spaghetti-sauce made with fish, instead of beef? Fish patties as common as hamburger? There are major implications for industry and consumers alike, in this Sea Grant-sponsored research.

Another extension effort relating to seafood in 1986 was the coordination of field trips so that owners of Long Island fish processing plants could observe and evaluate new fish-filleting and squid-skinning equipment in action.

As a result, at least $40,000 was invested by the private sector in the skinning machines. This has served to diversify and expand the companies' processing capacity, increasing their long-term viability.

These examples of research and extension efforts help to highlight the fact that science and technology, business and education all played a role in Sea Grant's seafood-related activities in 1986.

TOPICS OF INVESTIGATION FUNDED BY NEW YORK SEA GRANT, 1986

MARINE BIOTECHNOLOGY

"Tissue Culture/Genetic Enhancement of Laminaria Production," Boudewijn H. Brinkhuis, Howard G. Levine and A.D. Krikoran, SUNY/Stony Brook.

"Structural and Synthetic Studies on Marine Natural Products," Jon C. Clardy, Cornell University.

"Preparation and Elucidation of Beneficial Biological Effects of n-3 Polyunsaturated Fatty Acids from Marine Sources," John E. Kinsella and John B. German, Cornell University.

"Pressure-temperature Effects on the Growth, Product Formation, and Enzyme Activity of Extremely Thermophilic Marine Methanogens," Douglas S. Clark and William B. Street, Cornell University.

"Creation of Genetic Clones for Increased Commercial Production of Bay Scallops, Argopecten irradians," Richard K. Koehn and Vera M. Bricelj, SUNY/Stony Brook.

AQUACULTURE

"Factors Influencing Settlement, Metamorphosis, and Early Post-Larval Survival of the Bay Scallop, Argopecten irradians," Scott E. Siddall, SUNY/Stony Brook.

"The Role of Geochemical Factors in the Settlement, Metamorphosis, and Early Post-Larval Survival of the Soft Clam, Mya arenaria," Carmela Cuomo, SUNY/Stony Brook.

"Developing an Aquaculture Production System to Manipulate Zooplankton Populations and Culture Walleye Fingerlings in Earthen Ponds," Joseph K. Buttner, SUNY College at Brockport.

"Relative Contributions of Phytoplankton and Organic Detritus to the Diets of Suspension-Feeding Bivalves," Glenn R. Lopez and Robert E. Malouf, SUNY/Stony Brook.

COASTAL PROCESSES

"Hydraulics of Hanging Ice Dams," Hung Tao Shen, Clarkson University.

"Ice Dissipation in Natural Water Bodies," Akio Wake, SUNY/Buffalo.

"Wave, Climate and Shoreline Processes," Philip L.-F. Liu, Cornell University.

"Historical Changes in the Oceanography of Long Island Sound," William T. Peterson, SUNY/Stony Brook.

"A Passive Sampler for Organic Compounds in Water," John P. Hassett, SUNY College of Environmental Science and Forestry at Syracuse.

FISHERIES

"Genetic Identification of Parental Origins of 'Lake Ontario Strain' Lake Trout," Charles C. Krueger and B. May, Cornell University.

"The Economics of the Long Island Recreational Coastal Fishery," James R. Kahn, SUNY/Binghamton.

"Maintaining Quality of Fresh and Frozen Fish," Joe M. Regenstein, Cornell University.

"Production and Survival of the Planktonic Larval Stage of the Hard Clam Mercenaria mercenaria in the Great South Bay, with Emphasis on Predation by the Ctenophore, Mnemiopsis leidyi," Linda E. Duguay and William T. Peterson, SUNY/Stony Brook.

"Behavior and Behavior Modifiers of Important Shellfish Predators: the Crabs Neopanope sayi and Ovalipes ocellatus," Glenn R. Lopez and Robert E. Malouf, SUNY/Stony Brook.

REGIONAL PROJECTS

"A Framework for Evaluating the Impacts of Coastal Tourism Product Mixes at the Local Level," Tommy L. Brown, Cornell University.

"Food Habits of Adult Trout and Salmon in Lake Ontario," Stephen B. Brandt, SUNY College at Oswego and SUNY College of Environmental Science and Forestry at Syracuse.

INTERNATIONAL PROJECT

"Mariculture and Physiology of Commercially Valuable Red Seaweeds from Baja California," Boudwijn H. Brinkhuis, SUNY/Stony Brook.

COASTAL LAW

"Studies in Coastal Law," Robert I. Reis, SUNY/Buffalo.

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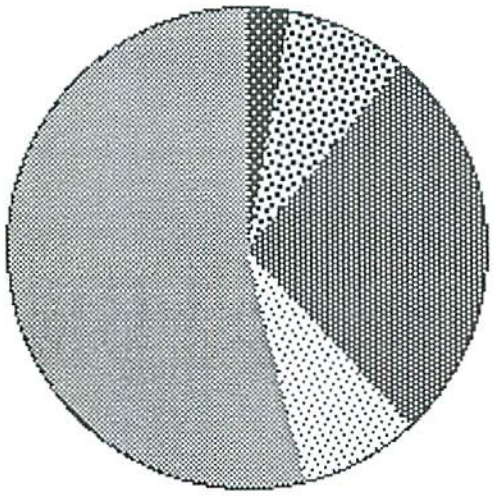
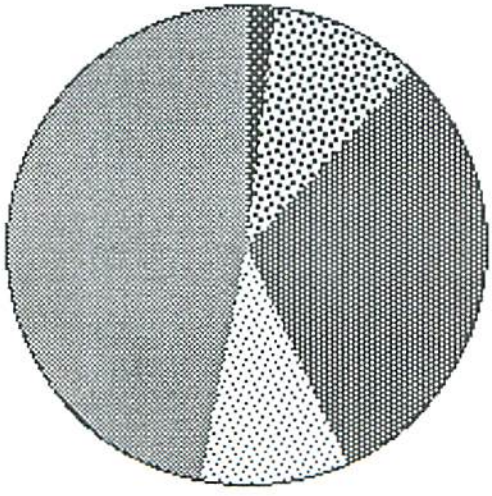
NYSGI Expenditures by Activity

1985



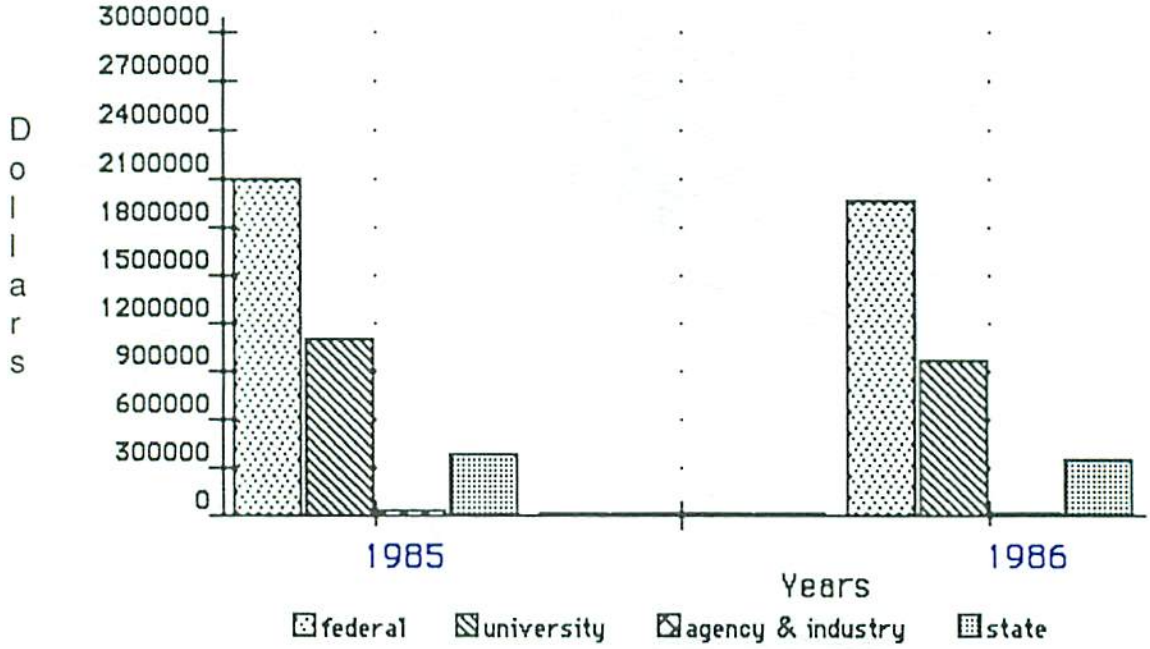
Communications	3.0%
Education	8.0%
Extension	27.0%
Management	8.0%
Research	54.0%

1986



Communications	2.0%
Education	10.0%
Extension	31.0%
Management	10.0%
Research	47.0%

Sources of NYSGI Funds



(Note: In 1985, agency/industry funding amounted to $35,000; in 1986, NYSGI received no agency or industry funds.)

For more information about the New York Sea Grant Institute, contact NYSGI at Discovery Hall, SUNY, Stony Brook, NY 11794-5000 (516) 632-6905.

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