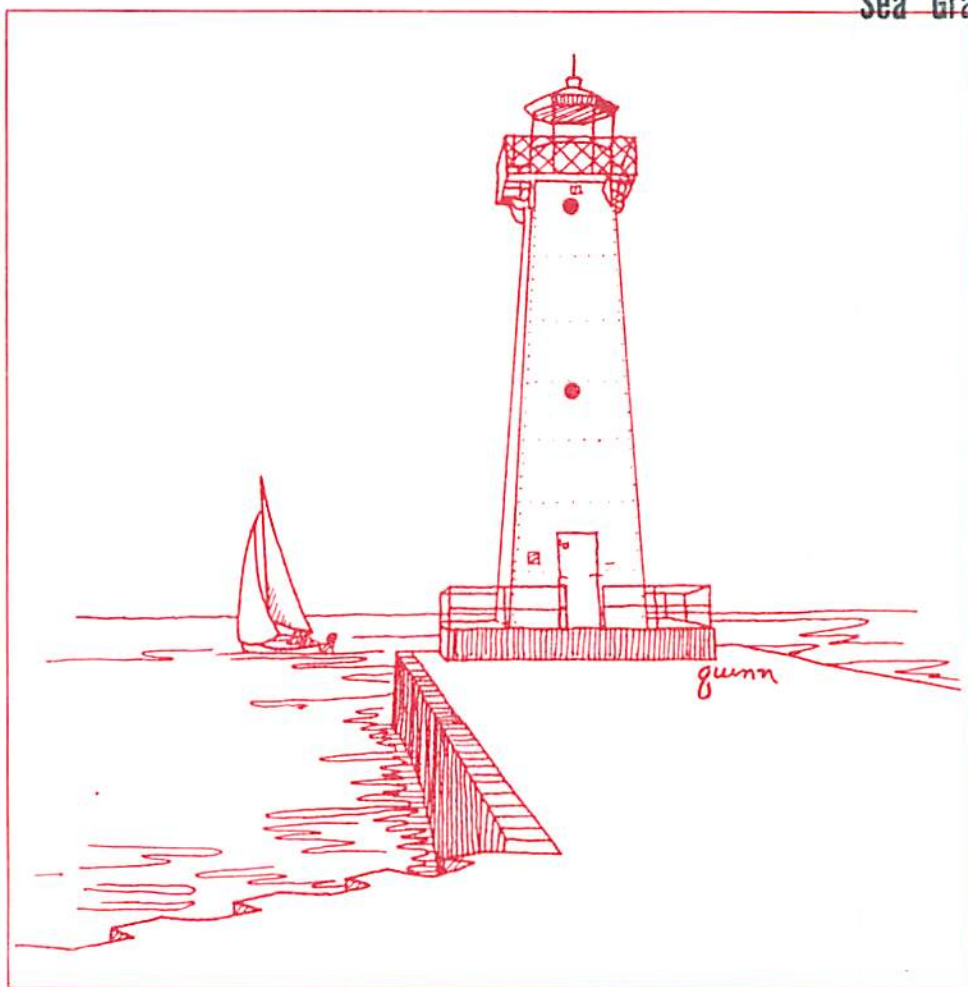


SITUATION STATEMENT AND PROGRAM PLAN - 1989

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New York Sea Grant
and Marine Extension Program
Fernow Hall
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Cornell
Cooperative
Extension



SITUATION STATEMENT AND PROGRAM PLAN - 1989

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*Helping You
Put Knowledge
to Work*

THE COASTAL SETTING

New York's Coasts: A Vital Natural Resource

New York State's coastlines are among its most utilized and valuable natural resources. Enough swimmers, boaters, and beachcombers visit New York's coasts each year to elevate tourism to the position of the State's second largest industry. These same coastal regions provide water for industry, public utilities and serve as a pathway for the transport of goods. They also provide a home for many of the State's most important fish and wildlife resources.

Bordered by Lakes Erie and Ontario, the Long Island Sound, and Atlantic Ocean, the Niagara and St. Lawrence rivers, and served by the Hudson River, New York State has more than 3,400 miles of shoreline. It is the only state to have shoreline on both an ocean and the Great Lakes. Almost 85 percent of the State's population lives in the coastal regions, with 15 million people living in 112 townships, 103 villages, 25 cities, and four American Indian reservations.

Extension: Helping You Put Knowledge to Work

University-based extension education programs can assist many individuals, groups, businesses, and agencies in the wise development, use and conservation of these vital coastal resources. In New York State, Cornell Cooperative Extension is the primary provider of campus-based educational outreach efforts, which are coordinated under its Sea Grant and Marine Extension Program area. Guided by Cornell's Land Grant and Sea Grant mission, county extension agents and regional extension specialists plan and deliver educational programs that help the State's residents, users and decision makers address current and projected coastal resource problems.

Our Mission

In carrying forth this educational initiative, extension agents and specialists seek to enhance opportunities to:

- gather up-to-date and relevant research-based information pertaining to coastal resources;
- transfer this information to people who can use it to solve coastal problems;
- stimulate appropriate persons to apply this information toward solving problems;
- stimulate researchers to generate new information needed to help solve coastal problems.

Program Development

To meet these broad educational goals, extension agents and specialists:

- prioritize, plan and conduct problem-solving educational programs and activities for audiences that may include commercial fishermen, recreation and tourism business people, seafood processors and handlers, consumers of fish and seafood products, contractors and developers, government officials at all levels, shoreline property owners, recreators, youth groups, and others;
- nurture and maintain close working relationships with other coastal agencies and organizations, so that program resources are used more efficiently and programs are implemented more effectively;

- assist in determining the directions and priorities of research efforts supported by the New York Sea Grant Institute, by the State University of New York, and by Cornell University, so that they are in accord with the needs of the coastal resource user and the welfare of society;
- encourage and support the adoption and implementation of coastal resource-related extension education programs by other extension professionals throughout the State and nation.

Implementation

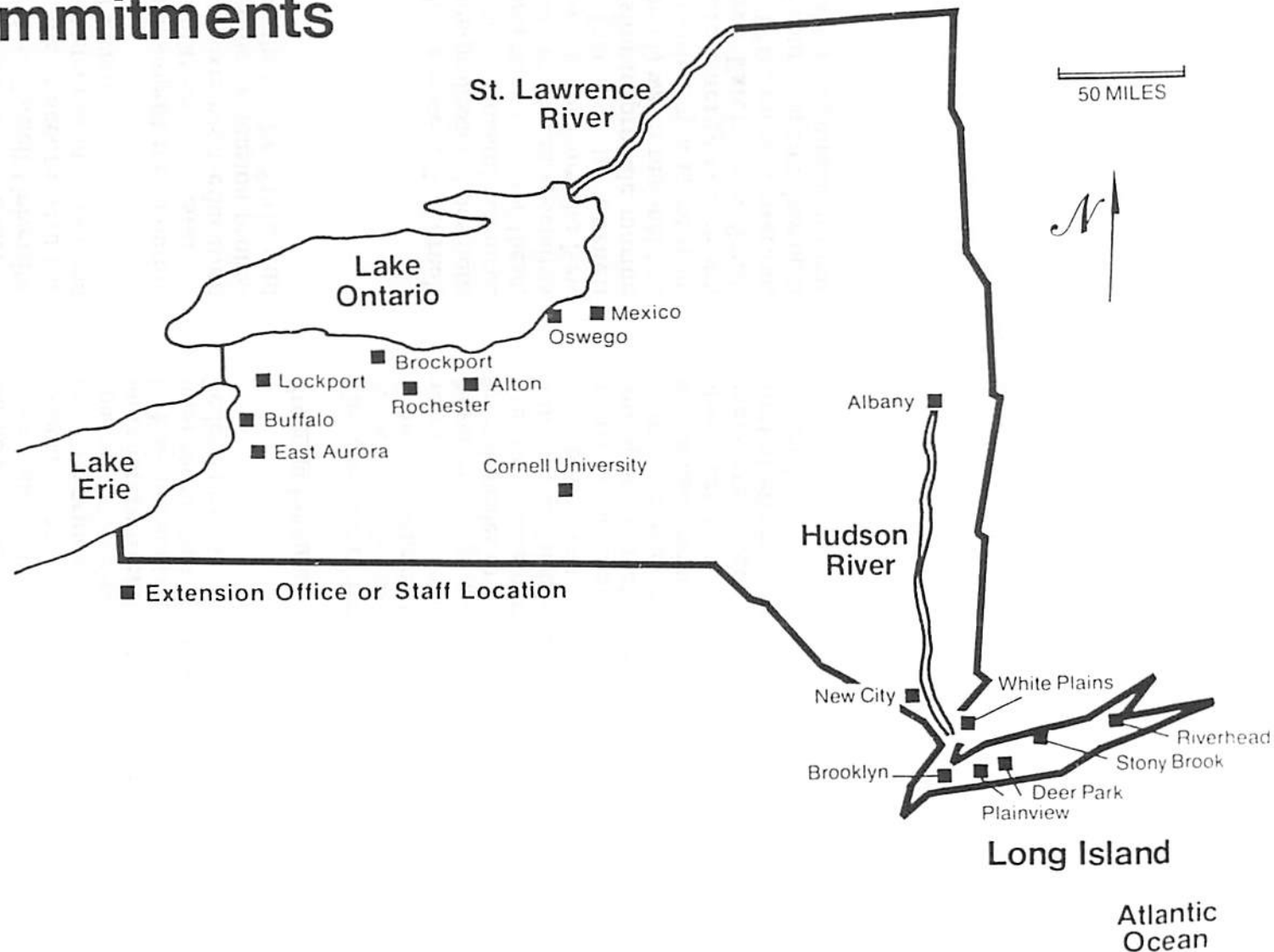
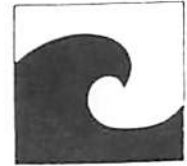
As of January 1989, there were 31 Cornell Cooperative Extension professional positions conducting some level of coastal resource related extension programming. Of these, nine (9) were regional Sea Grant specialists supported directly by a grant from the New York Sea Grant Institute to Cornell Cooperative Extension to provide marine advisory services; one (1) was a regional Sea Grant specialist supported by a grant from the New York State Energy Office via Cornell Cooperative Extension's Small Business Energy Efficiency Program; nineteen (19) were county agents having a marine or Great Lake component in their

extension programs; and two (2) were program management positions for the Sea Grant and Marine Extension program within Cornell Cooperative Extension. Numerous other county agents, campus-based extension associates, and university faculty at Cornell and at various SUNY campuses conduct coastal resource-related extension programming intermittently. (For a full review of FTE assignments in each issue area, see the most recent New York Sea Grant Extension Federal proposal.)

Program Planning

The spectrum of Extension efforts coordinated by Cornell Cooperative Extension's Sea Grant and Marine Extension Program varies according to local and regional needs. Nevertheless, problems are often common to several locales or regions. The following are situation statements that describe major problems and needs across the whole of New York State's coastal resource. These statements are also grouped into sections that correspond to major thrusts/issues identified by the Cooperative Extension Service (CES) system nationwide. Longer-term educational objectives to resolve such problems and needs are noted. Extension activities of limited effort or duration have not been included.

Location of Staff with Significant Sea Grant and Marine Extension Program Commitments



RECREATION FACILITY DESIGN, MANAGEMENT AND OPERATION

Background

The business of providing services and facilities for the millions of boaters and fishermen utilizing New York's Great Lakes and marine waters is a major component of New York's recreation/tourism industry. Some 2,000 private sector businesses cater to these recreational users. Boat building and repair enterprises, marinas, boatyards, yacht clubs and marine supply dealers are confronting problems and concerns similar to other small businesses of the tourism industry. Also challenged by these same problems are the 1,500 publicly operated facilities, (i.e. coastal parks, beaches, docking facilities, and access facilities) which are operated by local, county or state agencies.

Despite the projection that boating-related recreation will increase by over 28% by the year 2000, (in 1986, New York had 358,000 registered boats with over 58% registered in the Great Lakes and marine area, and in 1984 over \$300 million was spent statewide on the purchase of boats and related equipment) both public and private sector marine facilities development can be effected by changing economic, environmental and governmental trends and regulations. With demand far exceeding supply, new approaches are needed to increase facility effectiveness and efficiency. Improved practices in marine business management and marine facility management will help meet future needs and assist in improving industry profits.

Issues

Developers, owners and managers of marine recreation facilities need reliable information on options to assist in reducing operating costs; economically improve client services; maintain safe facilities; manage facilities for highest capacity utilization; and develop facilities to meet needs in a cost-efficient manner. Specific issues include:

- the need for public/private developer/operator options for cost-saving

facility improvements and new developments at marinas and boatyards;

- erosion of beach and bluff areas causing extensive damage to marine facilities;
- wave and ice damage, siltation and corrosion reducing the usable life of marine facilities;
- the lack of area-specific design information for developing efficient boat launch ramps, parking areas, docks, fuel and electric systems, storage facilities and moorings area;
- the need for improved marketing and hospitality training skills;
- regulatory agency and zoning board limitations on recreation facility development and expansions;
- collaborative public-private development and management of facilities;
- the need for facility operators to be aware of effective alternate facility maintenance/operation procedures.

Approach

Educational programs to enhance coastal recreation facility, development operation should emphasize:

- cost-efficient development of new facilities and efficient maintenance of existing ones. Projects might focus on site analysis, facility and equipment alternatives, creative funding sources and alternate management techniques;
- overhead cost reduction alternatives and techniques;
- options for preventive measures to protect facilities from potential damage caused by natural processes;

- business marketing techniques and hospitality skills;
- long-term planning techniques for facility improvements;
- collaborative opportunities for public/private facility development and management when appropriate;
- appropriate facility development/maintenance procedures.

Objectives

- To have potential and existing marine facility developers/operators evaluate alternate facility financing and designs.
- To have developers construct properly designed, sited and constructed facilities.
- To have existing facilities maintained and operated more effectively and efficiently.
- To have landowners and recreationists collaborate to minimize conflicts resulting from access to coastal waters.
- To have planners and developers recognize recreation access as a revenue-generating coastal waterfront development option.
- To assist community planners to maximize coastal recreation opportunities while minimizing attendant difficulties from them.
- To have coastal communities, businesses and public agencies evaluate access needs and possibilities for public and private collaboration that would enhance public access.
- To have community groups and public officials aware of alternate state and federal financial assistance available

for developing waterfront recreation facilities.

- To stimulate community groups, businesses and public officials to cooperatively assess, plan and, when appropriate, finance coastal recreation facilities.
- To enhance marine business owners understanding of energy management and provide information on how to manage energy costs effectively.

References

- Brown, Tommy L., and Nancy A. Connelly, *Analysis of Great Lakes Coastal Inventory Data*. NY Seaway Trail, Inc., Oswego, NY. 1987. 39 pp.
- Connelly, Nancy A. and Tommy L. Brown, *The Impact of Tourism on Employment in New York's Coastal Areas*. Cornell University Natural Resources Research and Extension Series No. 32: Ithaca, NY, 1988. 58 pp.
- Dawson, Chad P. *Expenditures of Anglers Fishing in New York's Great Lakes Waters*. NY Sea Grant Extension Publication, Oswego, NY. 1986. 4 pp.
- Dawson, Chad P. *New York State Boating Registration Trends*. NY Sea Grant Extension Publication, Oswego, NY. 1988. 4 pp.

SPORTFISHERY DEVELOPMENT

Background

New York State offers a unique blend of recreational sportfishing opportunities and resources. Within the confines of New York's borders, four internationally recognized sportfisheries are found: trophy sized trout, salmon and bass fishing in Lake Ontario; Lake Erie's productive walleye and smallmouth bass fishery; the esteemed St. Lawrence River muskellunge fishery; and the world-class marine waters of Long Island. With over 218 freshwater and 50 marine species, the use, management, and conservation of New York State's sportfisheries pose great challenges.

Each year, increasing numbers of anglers from throughout the country fish New York State's productive waters. The number of anglers utilizing New York's marine and freshwater sportfisheries exceeds 3 million. Licensed freshwater anglers in New York State exceeded 834,000 residents and 212,000 nonresidents in 1987. Most recent (1986) estimates for the number of boat trips made by resident and non-resident marine anglers totaled 5,128,000, contributing to a sport catch of 7,512,000 bluefish, 4,375,000 fluke, 4,357,000 flounder, 1,638,000 blackfish, 111,000 sharks, 38,000 cod and 31,000 weakfish. Between 1986 and 1987, the number of Lake Ontario fishing boat trips increased from 175,000 to 195,000 with a corresponding increase in sportfishing catch from 346,000 to 357,000. Advances in sportfishing technologies are at least partially responsible for these increases in catch figures.

These sportfisheries sustain numerous businesses including charterboats, marinas, boat liveries, fishing derby enterprises, bait and tackle dealers, motels and restaurants. Recent data suggest approximately \$1.1 billion is generated annually from New York's marine sportfishery, and over \$41 million annually from the Great Lakes sportfisheries. Approximately 25% of these expenditures came from non-resident anglers (outside of New York State). For example, total lake-shore economic impact of an annual spring

(4-day) fishing derby on Lake Ontario, increased from about \$480,000 in 1978 to around \$5.9 million in 1988. Revenues accrued from nonresident derby expenditures rose from \$133,000 (28% of the total input) to \$4.1 million (68.9% of the total impact).

Issues

Many owners of sportfishery-related businesses fail to recognize how certain management policies and current issues impact the sportfishery and their business. They are often unaware of small business management techniques that could enhance their economic efficiency and productivity. Consequently, limited economic growth and even business failure can result.

Many coastal communities are heavily dependent upon sportfishery-generated revenues. Many, however, fail to recognize the importance of various sportfishery enterprises to regional economies, and fail to adequately capitalize on the local potential for sportfishery development. Other communities that would like to incorporate sportfishery-related enterprises into their local economies often fail to do so because of a lack of understanding of how to properly develop the necessary resources needed to sustain a sportfishery.

Because of the economic ramifications of the sportfishery to coastal communities, angling clubs and county advisory boards are an integral part of the decision-making process on issues of concern, and help to set management policies that impact the sportfishing resources. Examples of such issues of concern in the Great Lakes include salmonid stocking rates, forage base dynamics, fish contaminants, exotic fish introduction control, and lake habitat rehabilitation efforts. Leadership within these groups often lack the expertise to communicate effectively with management agencies, leading to impairment of the interactive process. This can lead to conflict between agencies and user groups over management policies and strategies.

The marine fisheries and to a much lesser extent the Great Lakes fisheries yield several species which are subject to both commercial and sport harvest. The absence of a "catch-and-release" ethic by sport anglers combined with the high effort levels by both commercial and recreational fishermen has produced fully exploited stocks of some popular species in the marine district (ie. fluke, winter flounder). Conflicts between user groups over these and other fish stocks will certainly continue. As a result, lobbying pressure rather than biological resource data unduly influences resource management policies.

Approach

Educational programs designed and implemented to assist sportfishing interests should:

- provide information on the biology of fisheries resources and enhance awareness of the biological rationale of various management strategies;
- identify information gaps in biological aspects of sportfisheries and stimulate researchers to address them;
- facilitate the development, understanding and interaction in sportfisheries management options, policies and the decision-making processes;
- address community sportfishery related problems and assist in conflict resolution between various user groups and agencies;
- assist in the development of educational programs that provide information on the social, economic and community value and impact of sportfisheries;
- stimulate the development and adoption of new fishing techniques and technological gear advances;
- encourage conservation and wise use of fisheries resources.

Objectives

- To have sportfishery user groups and community interest groups better understand basic biological concepts and socio-economic impacts of sportfisheries, and apply this information in the decision-making process.
- To have public interest groups, resource user groups and management agencies recognize the importance of interactive communication skills and work towards more cooperative dialogue.
- To have sportfishery-related businesses and communities enhance resource utilization in the development of a sportfishery.
- To have user groups, coastal communities and owners of fishery-related businesses recognize the common goals that will insure the future health and stability of fisheries resources.
- To have the angling community in the Marine District and New York's Great Lakes waters recognize the necessity of fishery conservation programs.

References

- Blair, Linda and Chad P. Dawson. *Fishing License Sales in New York's Great Lakes Counties*. NY Sea Grant Extension, Oswego, NY. 1988.
- Dawson, Chad P. *Expenditures of Anglers Fishing in New York's Great Lakes Waters*. NY Sea Grant Extension, Oswego. 1986.
- National Marine Fisheries Service. *Status of the Fisheries Resources Off the Northeastern United States*. 1988.
- New York State Department of Environmental Conservation Bureau of Fisheries. *1988 Annual Report*. , Lake Ontario Unit. 1988.
- Sportfishing Institute. *Sportfishing Bulletin*. 1985.

Sportfishing Institute. *Sportfishing Bulletin*. 1986.

U.S. Department of Commerce. *Marine Recreational Fishery Statistics Survey, Atlantic and Gulf Coasts*. 1986.

Wayne County Public Information Office. *1988 ESLO Trout and Salmon Derby Angler Survey: A Report and Summary*. 1988.

TOURISM SMALL BUSINESS DEVELOPMENT

Background

The recreation/travel/tourism industry is the second largest industry in New York State and employs one out of ten private sector workers. This industry is mainly composed of small businesses which make significant economic contributions to coastal counties. In 1987, the N.Y.S. Dept. of Commerce reported that the private sector included 52,700 businesses statewide providing recreation, travel, and tourism facilities and employed 689,000 with a payroll of \$9.7 billion. This represents a 28.3% increase in employment between 1976 and 1987.

Both the public and private sectors provide land, facilities, and services to coastal recreationists and tourists. The public sector provides parks, historic sites, public access facilities, fish and wildlife resources, trail systems, navigation and boating safety facilities, and other services. The private sector offers commercial enterprises such as marinas, charterboats, bait and tackle shops, theme parks, resorts, motels, restaurants, retail stores, and other services. For example, the N.Y.S. Dept. of Commerce reported in 1987 that 2,200 lodging businesses covered by unemployment insurance employed 71,900 with a payroll of \$1.1 billion. Similarly, the N.Y.S. Dept. of Commerce reported in 1987 that 449 boat liveries, marinas, and yacht businesses (covered by unemployment insurance) employed 2,660 with a payroll of \$54.1 million. These reports are underestimates since they exclude family-operated businesses, sole proprietorships, and partnerships which do not employ persons covered by unemployment insurance. Significant percentages of this employment and business activity occurs in the coastal regions.

The coastal areas of the state offer a variety of opportunities for recreation and tourism activities. The most popular activities statewide are viewing scenery, sightseeing, visiting parks and recreational sites, swimming, fishing, and boating. In 1987, over 57 million people traveled to state parks and historic sites. By the year 2010, an estimated 111

million lake and ocean swimming days, 46 million angler days, and 39 million boating days will take place in New York State.

Issues

The prospects for the next 5 years are promising for recreation and tourism business. The coastal areas of the state include some of the most valuable natural and man-made attractions for year-round recreation and travel activities. While the recreation/travel/tourism industry has taken advantage of the natural resources and recreational sites, there is the potential for further development and improved marketing of existing opportunities.

Many of the privately-owned facilities and services in the coastal region are small businesses that are predominantly operated on a seasonal basis. Investments are being made by the private sector to open new businesses or to update and expand existing services and facilities. The owners and operators of small recreation and tourism businesses (e.g., resorts, motels, charterboats, marinas) need information, technical assistance, and educational programs to retain viability, expand, or create new businesses/services.

State, county, and local governments are planning for and developing additional recreational facilities in the coastal region. Tourism and coastal recreation plans are needed but often are not created to coordinate development strategies. Tourism development and marketing plans can aid decisions on the type, amount, and location of facilities and services to provide while minimizing user conflicts or degradation of the resource and providing public access/services at a reasonable cost. The viability of tourism and coastal recreation is also dependent upon the effective management of the natural, human, and manmade resources.

Coastal residents and visitors need to be aware of recreation and tourism opportunities and knowledgeable about how, when, and where to participate. Coastal tourism

associations and chambers of commerce spend substantial funds each year to manage, market, and promote their destination areas in a competitive and cost effective manner.

Approach

Educational programs to assist small businesses should:

- assist coastal tourism businesses which have a very critical business cycle. 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 feasibility of extending business to additional seasons should be explored. 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. New business development needs should focus programs on training in market analysis, economic development planning and forecasting economic development impacts;
- develop the leadership abilities of tourism businessmen to successfully organize and direct a trade association. This training should include programs to help leaders set goals. It should also include procedural and legal guidelines as well as 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. Efforts should be focused here on identifying the appropriate linkages and facilitating their establishment.

Educational programs to assist county and local governmental agencies should:

- help county/community decision makers understand the reasons why tourism and coastal recreation assets and liabilities need to be reviewed. Assist in the planning process, provide the tools which will help analyze assets and liabilities, assess future prospects, and weigh alternative courses of action. The sportfishery, lack of public access, economic development, and waterfront decay are some of the issues around which programming will evolve;
- help equip resource managers or those concerned with resource management with information on the principles of coastal resource management techniques. The carrying capacity of tourism and recreation areas and the potential impact of new coastal development options (e.g., second home development) also are worthy of attention;
- expose tourism organizations to how other coastal tourism destination areas are managed plus explain marketing and promotion techniques and evaluation methods. Example program areas which could be emphasized include vacation packaging, tourism marketing systems, and marketing evaluation.

Objectives

For small business:

- To have recreation/tourism business and trade associations increase their skills in evaluating their marketing approaches and efforts, and increase their networking and cooperative ventures for marketing and public relations.
- To have recreation/tourism businesses and trade associations identify, understand and use research data and

information on user demand, supply and financial trends in the recreation/tourism industry.

- To have recreation/tourism businesses improve their financial planning/management skills, including the use of computers and computer software for business management decision-making, pricing strategy-setting, financial statement/ratio analysis, tax and insurance decision making, bookkeeping, accounting, investing and financial decision-making.
- To have recreation/tourism businesses and trade groups better understand, appreciate and develop their human personnel resources via programs on stress management, employee productivity and loyalty, and on overcoming seasonal employment problems.
- To have recreation/tourism businesses adopt positive changes on facility operation, efficiency, planning and energy conservation.

For consumers:

- To have residents and coastal visitors receive coastal recreation information on where and when leisure opportunities exist and how to partake of those opportunities safely.

For county/local government agencies:

- To have communities and counties review their tourism and coastal recreation assets and liabilities, assess future prospects, and make a conscious decision on whether or not to proceed with tourism and coastal recreation development.
- To have county and community tourism organizations develop a tourism management strategy for their area and evaluate their tourism marketing and promotion techniques.

- To have trade groups and communities develop and/or expand their visitor information systems.
- To have public and private sector personnel and business and community leaders realize the importance of tourism in economic development and need for and benefits of hospitality training programs.
- To have resource management groups and 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 these issues.

References

- Brown, T.L. and N.A. Connelly. *The Impact of Tourism on Employment in New York's Coastal Areas*. Cornell Dept. of Natural Resources Research and Extension Services No. 32. 1988. 58 pp.
- New York State Dept. of Economic Development. *Tourism Master Plan: 1988 Evaluation & Review and 1989 Annual Strategy*. October, 1988. 24 pp.
- New York State Office of Parks, Recreation and Historic Preservation. *People, Resources and Recreation*. (Draft) 1988. 160 pp. + appendices
- Northeast Marine Advisory Council. *Marine Recreation Business Management: A Needs Analysis of University Research and Education*. 1985.

AQUACULTURE

Background

Aquaculture in New York State is at a crossroads. State, local and federal entities have recognized the economic possibilities of successful aquaculture ventures, and have responded with grant-in-aid programs supporting research, "seed" activities, and demonstration projects. Public and private dollars have been channeled to research programs in an effort to increase the knowledge base for culture of marine and freshwater organisms and for development of the equipment needed for rearing them. Despite these actions, little has been accomplished in terms of new company formation and development, in the adoption of new, innovative, "break-through" techniques within the aquaculture industry, or in initiation of a comprehensive state-supported aquaculture development program.

Issues

Among the barriers to expansion in Marine and Great Lakes aquaculture are competition for space and technical problems. While user conflicts are a potential problem in the Great Lakes (e.g. fish farmers vs. sportfishermen), in the Marine District these conflicts have a long and colorful history dating back over one-hundred years. Presently, the New York State Department of Environmental Conservation is proposing legislation that would make it easier for shellfish farmers to lease publicly-owned bottom lands in State waters. It is hoped that these new regulations will ease fears among commercial fishermen and allow small to mid-size mariculture companies to flourish.

Technical problems still remain, perhaps more so in the less controllable marine waters than in freshwater culture systems. The leading constraint to shellfish mariculture is predation, which can wipe out an unprotected crop and reduce harvests in protected ones. Industry development in the Great Lakes is hampered by contaminants in the natural environment which may or may not be a problem in cage-cultured fish.

The summer of 1988, with its ocean beach washups of garbage and medical wastes, stimulated interest in the controlled cultivation of finfish that could be called "farmed" and "contaminant free". Much of this interest was towards water reuse systems, such as the Cornell Aquaculture System and others that use minimal water inputs. These systems have yet to prove themselves commercially feasible, and need to be refined and critically evaluated by university and extension personnel.

Public and quasi-public aquaculture has fared better in terms of production and acceptance. On Long Island, three towns have or are planning shellfish hatcheries/nurseries to augment the recreational and commercial catches; and every town with a commercial shellfishery has some type of resource enhancement program. In Lake Ontario, over 130,000 walleye fingerlings have been stocked by the Niagara River Anglers Association and the Port Bay Association since 1986.

Despite these apparent success stories, there is a lack of evidence regarding the effectiveness of public stocking programs in both fresh and saltwater. While the political benefits may be reason enough for government-sponsored programs to continue, private groups need assurance that their efforts will make a difference and, if not, how these programs can be modified to increase their effectiveness.

Approach

Educational programs designed and implemented to assist aquaculture interests should:

- provide opportunities for enhanced aquaculture systems training;
- provide research based information on the effectiveness of various fish stocking programs;
- investigate alternative forms of aquaculture and enhance industry awareness of these systems;

- identify predation control mechanisms and their effectiveness;
- stimulate the research community to comprehensively investigate aquaculture concerns and interests.

Objectives

- To increase extension expertise in aquaculture through applied aquaculture training programs.
- To ascertain through applied research and linkages with the research community the effectiveness of finfish and shellfish stocking into public waters.
- To increase awareness of the status and potential of various forms of aquaculture in New York State through workshops, media and youth programs.
- To explore, through applied research and demonstrations, methods to control predation on shellfish beds that can be utilized by small to mid-size companies.
- To ascertain through linkages with the research community whether contaminants in the Great Lakes affects cage-cultured fish; and, if so, how can these impacts be minimized or mitigated by culturists.
- To continue to work with State and Federal regulatory agencies to modify regulations that constrain aquaculture development in New York State.
- To continue productive relationships with the New York State Aquaculture Association and the Northeastern Regional Aquaculture Association in order to better communicate with culturists, academia and fellow extension staff.
- To encourage and guide state legislative action that will stimulate the

implementation of a state-supported aquaculture development initiative that outlines and includes agency roles and responsibilities, enhanced disease diagnosis and control capability, and a statewide aquaculture extension program.

- To provide aquaculture enterprises with information on energy-saving techniques and to enhance efficiency of their operation.

References

Agriculture Committee, New York State Assembly. *Aquaculture in New York State: Technology, Research and Economic Development Prospects*. April 1988.

COMMERCIAL FISH HARVESTING

Background

Harvest of marine species in New York in 1988 was valued at \$54 million comprising some 38.2 million pounds of fisheries products. Harvesting techniques used by commercial fishermen vary widely in New York State from simply pushing one's feet into the bottom to collect shellfish, to operating highly sophisticated and investment-intensive processing/harvesting ships at sea. Harvesting can most conveniently be broken down into two categories: inshore and offshore. The inshore fisheries are comprised mainly of baymen and clambers who use hand-operated tools to gather their catches. Also included are lobstermen, pot fishermen, hook and line harvesters, fish trap operators, gillnetters, fyke netters and dredgers. The offshore fishery is mainly comprised of deep-sea trawlers ranging in size from 35' to 90', and longline vessels fishing for tuna and tile fish.

Issues

Contamination of fish has become an increasing problem in the marine coastal fisheries of New York. In 1986, a complete ban on harvest of striped bass was put into effect by the New York State Department of Environmental Conservation. Additionally, large acreages of public bottom lands have been closed to shell fishing due to bacterial survey tests conducted by the Department that identify waters unsuitable for shellfish harvest. These two events have combined to put stress on the inshore fishery by eliminating harvest outright and by putting additional pressure on available, yet already heavily-fished stocks by displaced harvesters.

A second prevalent problem in fisheries is declining stocks of all species. Offshore and inshore species are under heavy exploitation. This fact, coupled with declining water quality in important spawning areas, has resulted in declining standing stocks of fish available for harvest. The general deterioration in environmental quality does not have a specif-

ic point-source, but is associated with large-scale shoreside development in urban and sub-urban areas and population growth on Long Island.

Extensive stocks of offshore, underutilized species are available to New York fishermen. However, only modest market development for these species has occurred to date, and the transfer of harvesting, holding and processing knowledge and skills to capture them is needed.

Concern also exists for the rapid urbanization and development of ecologically important waterfront property. Curiously, it has been noted that the world is consuming almost twice as much seafood as it did twenty years ago, but while the value has increased, the adjusted prices of all seafood products has actually declined. As such, fishermen are generally hard pressed to survive. In New York, contamination and diminishing stocks contribute to the increasing pressure on fish processors and dock operators to convert docks and processing facilities into condominiums, restaurants and marinas.

Commercial fishermen's interest in certain species is shared in common by recreational interests. Finfish are a common property resource until captured. Since fish are held in common, competing interests often conflict, particularly when it involves inshore finfish stocks. To date, resolution of these conflicts often involves legislation relative to gear restrictions or harvest limitations, further restricting commercial catches.

Approach

Educational programs designed and implemented to assist commercial fish harvesting interests should:

- provide regulators and developers with information on the value of commercial fisheries and impacts of development upon this industry;

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. In 1988, approximately 8.3 million pounds of fish and shellfish landed by New York commercial fishermen contributed to the New York market. About one-third of this product was sold for processing purposes while the remainder was immediately sold via fresh-market retail trade or consigned to the wholesale market for distribution. Processing and fresh seafood sales are likely to continue as the major market channel.

New York fisheries products not sold fresh are either processed for other domestic markets or exported. Most of this product is processed by out-of-state companies. Both foreign and domestic seafood imports are also important sources for the New York consumer market.

U.S. per capita consumption of seafood in 1987 stood at 15.4 pounds, and it is estimated that the world is consuming almost twice as much seafood as it did twenty years ago. Prices paid by consumers are continually rising. Seafood purchased for home consumption represents less than half of the total market. An estimated 60-70% of seafood consumed in New York is sold in restaurants or as institutional offerings.

Issues

Fresh seafood products are highly perishable. Without processing, harvests must be sold as landed regardless of market supply and price. Further growth of the processed product market is necessary to maximize the fisherman's dockside profits during peak seasonal production periods. High product handling costs, estimated to be over 10 cents per pound of product sold, suggests that the opportunity to increase profitability through more efficient and cost-effective handling practices may exist.

Overall, U.S. domestic seafood demand, expected to increase because of changing dietary and taste preferences, 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 seafood, which to a great extent will require broad-based, long-term educational and promotional efforts. This situation is further exacerbated in New York due to environmental contamination (or the public perception of such) potential inshore fish and shellfish products. Domestic market consumption of undermarketed species (whiting, squid, dogfish, butterfish) has shown minimal growth.

In the New York area, considerable consumer concerns about seafood safety and inspection have affected sales. It is believed that significant growth in exports will ultimately depend on eliminating obstacles such as import duties, various foreign trade barriers and strategies, and the lack of consistent harvesting efforts, adequate processing facilities, proper handling procedures and quality standards.

Supply of a given species, seasonally and year-to-year, is difficult to control because of biological, environmental and fishery management factors, coupled with the fragmented and fiercely 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, may represent the greatest opportunity for future growth.

Approach

Educational programs designed and implemented 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 strategies;
- 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 and for expanding seafood markets;
- explore 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 the seafood industry, counties, region and state, and communicate such needs to the Sea Grant Institute, Cooperative Extension, the SUNY/Cornell University Seafood Technical program, fishery development foundations, and other academic/research institutions;
- assist the existing seafood industry in identifying seafood marketing problems, setting objectives and outlining plans of action and implementing a specific response program;
- facilitate the regional resolution of conflicts between commercial and recreational fishing interests through an educational approach designed to underscore their common interests in fish stocks, dockside facilities, access to marine water, dock development, improved species management information and resource enhancement programs;

Objectives

- To have fishermen, processors, wholesalers and retailers understand and

adopt quality standards that ensure that products meet market acceptance and regulatory standards.

- To assist private and public entities in developing and in penetrating domestic markets for such underutilized species as dogfish, whiting, squid, mackerel, etc.
- To have harvesters evaluate the feasibility of various marketing strategies, including forward integration and marketing cooperatives to achieve greater marketing ability.
- To have private and public investors understand the need and advantages for in-state facilities to process undermarketed species.
- To have the seafood industry identify and implement a response program for promotion and marketing.

References

Earl R. Combs Consultants, Inc. 1979.

The Port Authority of New York/New Jersey.
The Commercial Fishing Industry. 1982.

SEAFOOD TECHNOLOGY

Background

The seafood industry is an important economic enterprise in New York state. The large number of shoreside businesses involved in the processing, handling and distribution of seafoods represents the major portion of New York's overall seafood industry. These shoreside businesses handle and sell products landed in New York as well as the rest of the United States and many other parts of the world. Some 39 million pounds of finfish and shellfish worth almost \$53 million were landed at New York ports for sale or distribution in the region in 1987. Seafood products are also shipped to New York markets by sea, air, rail and truck from across the U.S. and around the world. According to statistics gathered by the Port Authority of New York & New Jersey, almost 208,000 tons of fish and fish products worth over \$936 million were imported into the port district in 1987. In addition, a large portion of the 88 million pounds of seafood sold at Fulton Market in 1987 was shipped to New York from all of the other seafood-producing states in the country.

The largest segment of New York's shoreside seafood industry is the wholesale-distribution sector. Of 300 companies currently listed in the New York State Fish and Seafood Suppliers Directory, 235 (78%) list themselves as wholesale distributors. The wholesaling and distribution of fish and seafood for a large part of both the domestic and many foreign markets is conducted by New York companies at various locations, such as the Fulton Fish Market in New York City. Over 75 wholesale seafood dealers operate at Fulton Market which is the largest wholesale market in the U.S. and the fifth largest in the world. A variety of other wholesale or combination wholesale-processing businesses are operated near major market outlets in suburban areas and urban centers in upstate NY.

Seafood processing and packing businesses are primarily located on Long Island and New York City with other processing businesses scattered near metropolitan areas in

upstate NY. Shellfish processing predominates on Long Island in close proximity to the resource. These firms primarily shuck, pack and freeze products such as surf clams, hard clams, oysters, squid, conch and crab. Other Long Island processing firms fillet and pack a variety of fish species for local sale. In New York City, smoked fish, cured fish products, gefilte fish, caviar, shrimp products and fresh and frozen fillets are the major processed seafood products.

New York also has a large and diverse retail sector. At least 700 independent retail stores have been identified in the Long Island-New York City-Lower Hudson metropolitan area alone. In addition, all of the major supermarket chains and the majority of restaurants in the state sell seafood products to the public. The value of the retail sector of the seafood industry in New York has been estimated to be worth over a billion dollars annually.

Although New York's seafood industry is large and diverse, many businesses are operating in an environment of increasing overhead costs and declining profit margins. To remain profitable, all of these firms must be flexible and adapt to changing market conditions. This will require the adoption of innovative management and marketing strategies while also utilizing new emerging technologies to increase productivity.

Cornell University has provided leadership in the identification and development of new seafood products and technologies. Research efforts include studies on the role of omega-3 fatty acids in various seafood products and technologies to preserve the quality of fatty omega-3 rich species, waste recovery and utilization techniques, low temperature preservation, and product quality maintenance. Strong program links are also maintained with institutions like Kingsborough Community College which offers a seafood business management degree program and a variety of other industry training programs in conjunction with Cornell and others. Other program links are maintained with state and local government, industry groups and organ-

izations, the National Marine Fisheries Service, Food and Drug Administration and special projects such as the Fishport facility in Brooklyn.

Issues

Shoreside seafood businesses in New York are faced with a variety of challenges. Pollution-related safety concerns have eroded public confidence in local products which resulted in depressed sales in 1988. This trend seems likely to continue in the near future. These same businesses are also facing increasing competition for adequate space to conduct their business and rising overhead costs for electricity, labor, supplies and other essentials. Businesses in all sectors of the seafood industry will need to adopt cost-saving measures to minimize expenses while expanding product lines and markets in order to maintain adequate profits.

In the past, seafood businesses in New York have also been slow in adopting innovative cost-saving procedures or technologies, and have been reluctant to capitalize on new market opportunities for lesser known species. In the seafood processing sector, new opportunities are needed to expand the existing processing capacity in New York, and existing businesses will need to continue to diversify and develop more further-processed and value-added products. The wholesale-distribution and retail sectors of New York's seafood industry will need to strengthen existing markets by enhancing the variety and quality of products and services that they provide to customers. This will require both the adoption of new technologies and expanded specialized educational efforts for employees and customers alike to help them respond to the growing needs and concerns of the more demanding and sophisticated consumers in the New York region.

Approach

Seafood technology program initiatives will provide leadership for educational programs for New York seafood processors, packers, wholesale-distribution firms and the retail

sector of the seafood industry. Educational program efforts will focus on product handling and quality maintenance, sanitation, product development, and the evaluation and use of new technologies and equipment. Expert advice and consultations with individual businesses designed to help them address or solve specific problems related to product expansion or the adoption of new technologies will be emphasized as needed and appropriate. Program efforts with individual companies will respect and protect proprietary interests to ensure and maintain effective working relationships.

Program linkages with industry, government and the academic community will be critical to stimulate the evaluation and adoption of new technologies. Effective working relationships with state and local government will be nurtured to stimulate resource sharing and collaboration. This work will be carried out through individual contacts and discussions and through organized groups such as the Seafood Processing committee of the Suffolk Fisheries Task Force, the New York Interagency Committee on Aquatic Resources Development and others. Working relations will also continue with industry groups such as Fulton Market Information Service, Long Island Seafood Retailers Association, Long Island Shellfish Dealers and others to identify emerging needs and opportunities. Effective linkages with the National Marine Fisheries Service regional laboratories and university faculty in the northeast and other regions will be utilized to identify research needs and provide opportunities for expertise from the academic community to be made available to New York businesses as needed. These networking efforts will be critical to stimulate new opportunities for the seafood industry in New York.

Objectives

- To have seafood processors, distributors and retailers consider, adopt and evaluate appropriate new operating procedures or technologies to enhance profitability.

- To have all sectors of the seafood industry consider, adopt and evaluate handling techniques that maximize the quality of all products.
- To develop and provide information that will help all sectors of the seafood industry to effectively and accurately respond to consumer and media questions about seafood safety and quality.
- To assist the industry and government in evaluating and developing opportunities to expand processing capacity and facilities.
- To provide educational programs and training opportunities for all types of seafood businesses in cooperation with academia and government.
- To have all sectors of the shoreside seafood industry evaluate and utilize as appropriate new opportunities for marketing both new product concepts and non-traditional species.
- To help all sectors of the seafood industry evaluate and utilize appropriate programs, such as voluntary or mandatory inspection, and to maximize product quality and safety as appropriate.
- To provide seafood businesses with information to enhance energy savings and improve energy efficiency of their operation.

References

Fulton Fish Market Information Services Newsletter. Vol. I, No. 1, New York, NY. February 1988.

New York State Department of State Division of Coastal Management and Waterfront Revitalization. *New York State Fish and Seafood Suppliers Directory 1988-89*. Albany, 1988.

Port Authority of New York and New Jersey. *VIA Port of New York-New Jersey*. Vol. 40 No. 6. New York, NY. June 1988.

ENVIRONMENTAL QUALITY

Background

In addition to its ecological, esthetic and historical significance, New York State's coastline supports a wide variety of industrial, commercial, recreational, and residential uses which, in turn, contribute millions of dollars to the area's economy. Environmentally and economically, the coast and adjacent waters are of great importance.

The demands placed on our coastal resources are numerous and varied and include industrial, commercial, recreational, residential, and agricultural uses. These uses often conflict with each other and are not always compatible with the environmental resources of the coast. In fact, all of these uses can degrade coastal environmental quality. The close inter-relationship between the biological, physical, and chemical processes that characterize this area make it extremely sensitive to both natural changes and human activities associated with land use and coastal development.

The continued improvement and protection of the environmental quality of New York's coasts is of statewide concern. The negative impacts of improperly treated wastes, habitat loss, and the problems associated with solid and toxic waste disposal are well documented.

In most cases, government agencies, groups, and individuals involved with coastal development and resource use are concerned primarily with protecting biological and esthetic resources. Present permitting programs on the federal, state, and local level focus on identifying and preventing direct, adverse impacts on aquatic animal and plant life or preventing further reductions in water quality, such as physical disturbance of organisms, removal of habitat on a site-specific level, or addition of contaminants at levels higher than already present. However, because of a lack of understanding or knowledge about the complex nature of the coast and the interdependency of the various components and processes found in this

environment, little or no consideration is given to the indirect effects of coastal development activities on the system as a whole.

Issues

Recently, problems associated with coastal pollution have come to the forefront in public concern. A recent media survey found that environmental pollution is the top priority issue for many Long Islanders, even more important than the issues of crime and drugs. This perception extends to New York's other coastal communities as well.

Coastal pollution and its resultant habitat degradation and loss exacts a high toll in terms of both dollars and biological resources. Millions of tourist and recreation dollars are lost when pollution decreases the public utilization of coastal resources. The economies of many coastal areas are highly dependent upon this use. Furthermore, habitat loss and degradation can lead to reduced abundance of fish and shellfish or an increase in the amount of uncertified waters. This can lead to reduced or lost income from commercial and recreational fisheries. The public perception of the safety of consuming New York's fish and shellfish can have negative financial impacts on wholesale, retail, and restaurant sales.

Effective maintenance of the quality of our environment requires a comprehensive knowledge of the geological, physical, biological and chemical characteristics of the coastal zone. For this reason, significant amounts of research have focused on increasing our understanding of the various processes acting in the near shore environment, developing methods to evaluate potential affects of human activities on the ecosystem, and identifying new strategies and techniques to minimize or mitigate potential adverse impacts associated with coastal use.

Unfortunately, the local governments, coastal businesses, private individuals, and community groups who have the most involvement in

and responsibility for decisions regarding shoreline use are not aware of the information available, or do not have the expertise, resources or technical background to utilize this information effectively.

Consequently, local governments, coastal businesses, private individuals and community groups are not able to identify and evaluate the range of impacts associated with coastal uses or the potential methods of mitigating some impacts resulting from inappropriate resource use.

Because there are over 40 state and federal agencies or programs involved in coastal decision making, local audiences are often confused or do not understand the roles and responsibilities of these agencies, what type of assistance is available to them, or the ramifications of their actions in the coastal environment. This often leads to conflicts between resource users and governmental bodies, loss of potential resources, duplication of effort, and ineffective or inefficient coastal management strategies due to miscommunication between the public and the regulatory bodies among local, state and federal entities.

Approach

An array of coastal issues, including coastal development, waste treatment, and pollution control, demand educational treatment and application of unbiased, current technical information. There is a need to develop and strengthen local leadership in coastal resource management by assisting coastal communities with locating, interpreting and utilizing available information and research results to resolve marine environmental issues and concerns. It is important that leaders be aware of coastal resource problems and understand the need for effective planning.

There is also a need for increased awareness of innovative measures for mitigating coastal environmental impacts and stimulate their use in coastal development, design and public decision making policy by providing a link between researchers and the local, state, and

federal agencies involved in coastal resource management. Through educational programs designed to increase public awareness of coastal pollution issues, extension efforts can influence change in public and private perceptions about, and decisions on, coastal resource utilization and conservation.

Objectives

- To have government officials and local leaders become more knowledgeable about marine pollution components of state and federal programs, legislation, and regulations and keep them informed of change in the areas which may affect their communities.
- To have local government officials, developers, and coastal businesses utilize information on new techniques and alternatives for handling coastal marine pollution problems associated with coastal uses.
- To have coastal communities more easily locate, interpret, and utilize available technical information and research results to resolve coastal environmental issues and concerns.
- To have government officials, community groups, youths, and the public become more knowledgeable about means of mitigating or reducing the spread and effects of pollution in our coastal waters.
- To have community leaders, decision makers, investors, and the public gain an increased understanding of the biological resources and processes of the coastal environment, and measures for mitigating coastal environmental impacts so that these technologies are used in coastal planning, development and public policy making.
- To have government officials, community groups, youths, and the public become more knowledgeable

about water quality and pollution issues in our coastal waters that adversely effect marine life, livelihoods, and recreation.

- To have government officials, community leaders, decision makers, youths, and the public gain an increased awareness of the adverse effects that disposal of waste products (including non-degradable materials, primarily plastics) have on coastal environments, aquatic life, local economies, and quality of life.
- To have community leaders gain an increased awareness of biological information needs relating to local coastal environmental issues, and the potential and feasibility of addressing these issues via biological monitoring programs or research projects.
- To have the media gain a more accurate and objective understanding of coastal pollution issues so that they can in turn, better inform the public of the actual problems/issues at hand.

References

"Don't Go Near The Water". *Newsweek*. August 1, 1988.

"Our Filthy Seas". *Time*. August 1, 1988.

"Troubled Waters". *Business Week*. October 12, 1987.

New York State Department of Environmental Conservation. *Investigation: Sources of Beach Washups in 1988*. 1988.

EROSION AND PROCESSES

Background

The economic impacts, both direct and indirect, associated with coastal processes are substantial. Shoreline erosion rates ranging from 1 to 20 feet per year along much of the marine and Great Lake's coast result in millions of dollars of damage annually. On Long Island, direct annual erosion losses were estimated at \$14 million per year in 1970 and more recent planning studies have shown that over \$3 billion worth of residential commercial and industrial structures are at risk from coastal erosion and flooding on the south shore alone. In addition to the direct losses associated with erosion and flooding damages, the effect of the degradation of recreational resources associated with erosion must also be considered. Economists have estimated that the decline in beach attendance caused by the pollution problems of 1988 translated to a \$1.3 billion loss to the Long Island regional economy. The closing of beaches due to erosion, such as occurred at several Long Island beaches in 1987, would have similar economic impacts.

On the Great Lakes, a study found that residents on Lake Ontario spent nearly \$60 million on erosion control between 1972 and 1976 but still experienced losses of \$45 million during the same period. This was primarily due to the fact that less than half of the structures constructed were not properly designed for site conditions. On Lake Erie, one storm caused millions of dollars in erosion damages along a twenty mile stretch of shore and resulted in three towns in two counties being declared federal disaster areas.

Between 1977 and 1987, statewide federal insurance claims for coastal flooding and erosion have totaled \$95.7 million or \$9.6 million per year. In addition, public disaster assistance from federal and state sources has amounted to about \$20 million annually since 1971.

Unfortunately, a number of observed trends indicate that problems associated with coast-

al processes in New York may become even more severe in the near future. These trends, which include: predictions of a rapidly rising sea level and continued fluctuation of Great Lakes' water levels; a shift in responsibility for approving, implementing and funding erosion control and dredging projects from the federal to the state and local level; an increased demand for coastal facilities and the development of shoreline areas; a growing environmental awareness of these areas; and changes in regulatory policy, all mean coastal managers and resource users will be faced with increasingly complex, difficult and expensive decisions regarding coastal processes and erosion control.

Issues

Because of the complexity and site specific nature of most coastal erosion problems, government officials, businesses, communities, and individual coastal resource users involved in decision-making have a poor understanding of coastal processes, lack reliable information on the environmental and technical issues associated with erosion control and dredging, and are generally unaware of potential sources of information and assistance in these areas.

As a result, coastal projects, both large and small, are often implemented without an adequate knowledge of the processes operating in an area, the range of alternatives available and their impacts, or the most basic environmental information necessary to make an informed decision. The consequences are often disastrous. Improper design and siting of a groin field in Westhampton Beach, Long Island has resulted in exacerbated erosion and created a situation which will cost between \$25 to \$160 million dollars to correct. Without an adequate understanding of coastal dynamics or the regional sediment system, a decision was made to halt a major maintenance dredging project at Fire Island Inlet. The erosion caused by this disruption of the sand transport along the shore closed a major public

beach and adjacent highway several times despite the enactment of temporary mitigation measures estimated to cost \$1 million.

Similar problems are also encountered with the smaller, but more numerous, coastal projects implemented by a wide range of public and private interests. Projects using traditional erosion control methods are often improperly planned, implemented, and poorly maintained. Cost saving, environmentally compatible, nonstructural or innovative alternatives to the traditional erosion control and dredging practices are rarely considered. This often leads to higher long-term costs, greater potential for damages and economic losses. In response to heightened environmental concerns, regulatory agencies are more reluctant to approve needed erosion control and dredging projects because they do not have the quantitative information on environmental parameters or potential adverse impacts to adequately evaluate these activities. This lack of information often leads to environmentally-sound, beneficial projects being denied while potentially damaging ones are allowed. As a result, commercial and recreational opportunities are lost, economic losses continue to rise, and antagonism between coastal resource users and regulatory agencies intensifies.

Under the Coastal Erosion Hazards Act many local governments will take over responsibilities for regulating and permitting erosion control measures. Local governments and communities with limited manpower and expertise in this area will require timely factual information on coastal dynamics, erosion control technologies, and existing federal and state policies and regulations concerning coastal processes management to effectively assume those new responsibilities and resolve their erosion problems.

Approach

Educational programs to resolve coastal erosion and processes problems should focus on:

- assisting property owners and government entities in analyzing the

causes, severity and extent of coastal erosion and dredging problems;

- developing techniques and materials which would better enable private and public shoreline owners, contractors, consultants and local governments to evaluate, select, and implement structural and non-structural erosion control and dredging strategies in light of economical, environmental and regulatory factors;
- providing coastal resource users and managers with available coastal information in a form that will facilitate its use;
- increasing the awareness of government officials, planners, and the public of predicted trends in physical processes related to erosion (i.e., sea level) and the ramifications of these trends with regard to coastal development and construction practices;
- providing local governments with the technical and regulatory information they need to implement effective erosion management plans and regulations under the Coastal Erosion Hazards Area Act;
- helping planners, decision makers, and community leaders better understand the type of environmental information needed to effectively plan and develop erosion control measures and the most efficient means of obtaining this information;
- identifying information needs and gaps in coastal processes problems and, where appropriate, stimulate applied/basic research in these areas by university/government/private industry entities;

Objectives

- To have government officials, businesses, community leaders, and landowners better understand the

processes causing erosion and sedimentation and be better able to evaluate appropriate strategies and their potential impacts when addressing coastal processes problems.

- To have coastal government decision makers, contractors, consultants and landowners use sound technical information in the selection, siting, and design of erosion control measures.
- To have decision makers, businesses, and landowners become more aware of innovative alternatives and approaches to erosion and sedimentation problems that incorporate soft engineering or natural processes enhancing techniques to mitigate adverse impacts.
- To have public and private coastal audiences better able to locate, interpret, and utilize available technical information and research results to evaluate and resolve issues and concerns related to coastal processes and erosion.
- To have coastal planners, regulators, resource users, and community leaders become aware of existing and new technologies and methods for obtaining environmental information they need to accurately identify and assess the impacts of existing and planned coastal projects and to use these techniques to formulate cost efficient alternatives for minimizing adverse affects where appropriate.
- To have local municipalities who adopt Coastal Hazards Area regulations use objective, research-based information assistance to develop and implement effective, efficient coastal erosion management programs.
- To have government officials, planners, and community leaders become more familiar with predicted trends in long-term sea and lake water level fluctuations, the ramifications of these

changes on development practices, and possible mitigative strategies, and use this information in community planning.

- To have community leaders, businesses, and private individuals become more familiar with government programs regulating and managing coastal development and incorporate the provisions of these programs into coastal development and construction practices.

References

Long Island Regional Planning Board. *Coastal Zone Management, Coastal Erosion Sub-plan*. 1978.

Long Island Regional Planning Board. *Hurricane Damage Mitigation Plan for the South Shore of Nassau and Suffolk Counties, New York*. 1984.

U.S. Army Corps of Engineers. *Environmental Impact Statement, Hurricane Flooding and Erosion Control Plan - Fire Island to Montauk, NY*. 1977.

U.S. Army Corps of Engineers. *National Shoreline Study*. 1971.

RESOURCE MANAGEMENT

Background

New York has historically been a maritime state with ship building, commercial shipping, commercial fishing, and coastal recreation uses occurring along both the Great Lakes and marine coasts. While the intensity and balance of these various activities has changed over the years, the state's maritime heritage and continuing coastal activities remain important to its residents. Today, New York's large coastal population is increasingly demanding more and better access to the state's coastal resources. A large number of new public and private access, recreation, and residential projects have been implemented in recent years and many more are in the planning stages.

Of the state's 255 waterfront communities, 20 have adopted local plans for the revitalization and reuse of their waterfronts; an additional 95 are in the process of preparing such plans. Such revitalization or reuse of existing coastal infrastructure holds the promise of enhancing the coastal environment, stimulating new, well-planned economic growth, and enriching the coastal experience. Furthermore, reuse of existing coastal development could conserve undeveloped areas which may otherwise face increased development pressures.

Issues

Inadequately planning for the use of our coastal resources frequently results in inefficient utilization, conflicts between competing uses, and deterioration of the very resources which attracted the users to New York's coasts. Historically, different coastal resource uses have been haphazardly interspersed throughout the coastal zone. All too frequently these past uses have been incompatible with the natural ecological characteristics of the coast. While recent years have seen an increase in coastal environmental awareness, numerous proposed future uses continue to follow the pattern of coastal resource mismanagement and misallocation.

Coastal resource use potentials and problems do not fit easily within a single technical category, either because they are interdisciplinary in nature, or because social, rather than technical, decisions are called for in their solution. Better public understanding of coastal resources and resource management practices is needed in order to curtail (or at least reduce) the negative impacts of filling or dredging important coastal wetlands, careless discharge of toxic and sanitary wastes, disturbing highly erodible soils, and removing valuable agricultural land from production. Coastal resource conservation and management programs must not, however, be so narrowly implemented as to preclude well-planned, environmentally compatible, water-dependent coastal projects. Improvements in the public awareness of coastal resource management issues such as waste treatment, water quality remediation, dredging and dredge spoil disposal, erosion control, runoff mitigation, and fish and wildlife habitat conservation and restoration are essential to meet the need for clean water and air, healthy fish and wildlife populations, the preservation of agricultural land, and an esthetically-pleasing and recreationally rewarding shoreline.

Much of New York's existing coastal infrastructure has deteriorated and continues to do so while such necessary coastal recreation facilities as marinas, boat launches, and public access sites remain in short supply. In some instances this has caused a degraded coastal environment, in others a diminished socio-economic base of coastal communities, and in some cases, both. In some areas of the coast, new coastal facilities such as marinas, boat launches, and public access sites have been poorly planned and developed, located in ecologically incompatible areas, or are altogether lacking. Revitalization or reuse of deteriorated coastal infrastructure could help meet existing needs for increased and/or improved coastal community growth while reducing the development pressures on other undeveloped, under-developed, or ecologically sensitive areas. While 115 waterfront communities are working toward such revital-

ization and reuse of their waterfronts, many other communities have yet to take the first step on the road to improving and conserving their coastal resources.

Communication, public participation, competent technical information, and a thorough understanding of issues are key elements in the preparation of coastal resource management and/or development plans and in the project review and approval process. When any of these elements are missing or only superficially represented, disorder is often the result. Breaking down barriers of self-interest, perceived disenfranchisement, and lack of information with factual presentations requires a neutral, trusted information source familiar with both the issues, the technical information, and conflict resolution techniques.

Technical information on coastal issues is often not available in a form readily understandable to non-technical coastal decision makers. Assistance frequently is needed to identify, secure, and translate available data into a useful decision making tool.

Approach

It is important that leaders be aware of coastal resource problems and understand the need for effective planning. Greater community input can be fostered by educating community leaders on various aspects of public participation. There is a need to facilitate communication and cooperation among coastal resource users and decision makers and facilitate the decision-making process in the coastal zone.

By being a credible, neutral, and trusted information and education source, Extension can help bring coastal decision makers together with information available on resource management topics. Extension can help gather and analyze existing information to make projections of what coastal resource issues of the future might be, what opportunities and conflicts might need to be faced, and what alternatives might be considered to make the most of opportunities while minimizing conflicts.

Objectives

- To have state and local government agencies, community and business leaders, special interest groups, educators, the media, youth, entrepreneurs, and concerned individuals consider and utilize technical analyses, based on current research, to fully plan or evaluate proposed coastal resource management activities.
- To have community leaders, decision makers and investors gain an increased awareness of the current and potential uses of the coastal zone, and the potential impacts of such uses.
- To have community leaders and user groups better understand resource issues, and thus become more involved in identifying trends and opportunities affecting their communities, in making resource use and development decisions that are compatible with local coastal ecosystems, and in setting new coastal public policies.
- To have local government, special interests and concerned citizens identify and strengthen communication channels and linkages on coastal resource topics.
- To increase and strengthen the pool of local leadership and its capabilities in coastal resource management (policy, planning, use, conservation, restoration) programs.
- To have local governments and special interest groups more 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.
- To have diverse and competing interest groups minimize unproductive conflicts through cooperation and coordination, while enhancing their

abilities to represent and articulate their own viewpoints.

- To have public and private developers and investors prepare ecologically sound development proposals and reject ecologically unsound plans for underutilized and underdeveloped coastal areas.
- To encourage the development of coastal resource conservation ethics among coastal resource user groups to help insure the long-term health and stability of coastal resources.

YOUTH EDUCATION/LEADERSHIP DEVELOPMENT

Background

Numbering almost 4 million, youth aged 5-19 make up a large portion of our state's total population. Many of these youth live in areas close to our coasts as there are more than 460 public school districts in our coastal areas. We know that 647,800 youth aged 6-15 fish, and approximately 80% of all youth swim, making youth a potentially significant coastal user group. These youth are forming skills and ideas that will be the basis of decisions made about our resources in future years.

Issues

As we approach the 21st Century, water related issues have become more important in our interaction with the environment. We are faced each day with decisions concerning such things as the proper disposal of wastes, the use of plastics, water quality, and global warming. The decisions we make become more critical as economic demands and populations grow, further stressing the environment.

Our attention is also focused on our schools where complaints about the quality of science education and concerns about the level of science knowledge have been expressed. Government and school leaders point out that, in America, science is falling behind. Student's understanding of new technologies and preparation for scientific careers is lagging behind other developed nations.

America faces shortages of seafood from its own waters. Polluted coastal areas and an underdeveloped aquaculture industry keep our seafood production low. We import vast quantities of fish, adding to our trade deficit.

Approach

Extension is uniquely positioned to address the above issues. Through the 4-H program, which reaches more than one-half million of the close to four million youths in New York,

we have the opportunity to reach significant numbers of young people who will be the decision makers and scientists of the future.

4-H youth education efforts have long been a means to change attitudes and practices through research-based knowledge. Youth have been found to be more adaptable to change, and new approaches have found their way through the youth to their parents. Tomorrow's aquaculturist can be developed through 4-H programs just as 4-H has developed our nation's agricultural leaders.

Because of the limitations of resources, we must continue to refine the "teach the teachers" approach in our program. Recent trends have shown a progressive increase in 4-H natural resources and aquaculture-related enrollment. This must be continued through exciting, innovative and relevant programming. Extension staff have technical competencies in coastal issues so that we can frame our programs to involve youth in real coastal problems. Decision-making skills can be developed through this approach. School systems and 4-H programs will continue to be the primary channels for our efforts.

Objectives

- To have the boroughs of New York City conduct marine or sportfishing activities .
- To have an inter-county 4-H sportfishing exchange program bring kids from different counties to fish in each others waters.
- To have New York City 4-H clubs participate in a summer sailing/marine ecology program.
- To have 4-H clubs in Oswego County expand their knowledge of fishing techniques and fisheries management, and gain a greater appreciation for our aquatic resources through programs conducted by the Oswego County "Master Anglers".

- To coordinate new, and support the six existing, "Master Angler" programs statewide.
- To have all Sea Grant college employed specialists recognize youth as an audience for their subject matter expertise.
- To assist in the development of Cornell's Sportfishing/Aquatic Resources Program statewide, serving as regional coordinators as needed.
- To enhance the opportunities for youth to participate in sportfishing aquatic resources clubs.
- To develop short term aquatic resources educational activities through which 4-H youth will increase their knowledge of New York's diverse aquatic resources.
- To encourage the participation of teachers in Project Wild aquatic resources workshops.
- To promote the expansion of marine and aquatic education by fostering networking and diffusion of materials and resources among states, regions, and across the nation.
- To have 4-H natural resource agents provided with technical marine subject area expertise and backstopping.

References

- Cornell University Cooperative Extension. 4-H Enrollment Statistics. Ithaca, NY. 1987.
- Great Lakes Education Task Forces. *Opportunities for Expanding Great Lakes Education in the Region's Classrooms*. Great Lakes Commission. Ann Arbor, MI. 1989.
- Lassoie, J.P. *Situation and Trends Affecting New York State Cooperative Extension Programming in Natural Resources*. Department of Natural Resources, Cornell University, Ithaca, NY. 1986.
- New York State Department of Environmental Conservation. *Economic Value of Fishing, Sport, and Wildlife-Related Recreation in New York State*. Albany, NY. 1986.
- New York State Office of Parks, Recreation and Historic Preservation. SCORP Update. 1982.
- U.S. Census Statistics, 1980.

SEAFOOD UTILIZATION AND SAFETY

Background

Seafood consumption has risen steadily in the U.S. since 1982 reaching an all time record of 15.4 pounds per capita in 1987. Increasing seafood consumption trends appear to be related in part to the public's interest in the relationships between diet and health. Although seafood has been generally perceived to be healthy and nutritious, as a commodity it is confusing to many because of the incredible diversity of seafood products available in the marketplace, confusion about real and perceived safety concerns, and the perceived risks associated with seafood purchases because of a lack of knowledge about the product and its uses.

Seafood is one type of food that provides the taste, convenience and nutrition that most people desire in their food selections. In addition, eating more seafood fits current dietary recommendations consistent with the type of low-fat diets being suggested by the U.S. Surgeon General and a variety of government agencies and health organizations as being beneficial to long term health. Information is needed on the nutritional properties, of a wide range of different seafood products and omega-3 fatty acids available in the marketplace to help consumers utilize seafoods in a way that can maximize health benefits.

The variety of seafood products available in New York is diverse and characteristic of the region's role as a center for both domestic and international trade. According to Fulton Market's Information Service, over 530 different species of fish and shellfish have been sold at the market since 1986. Between 50 to 200 varieties of seafood are available in the marketplace during the course of a typical week. While this tremendous variety can be utilized to appeal to a wide range of individual tastes and preferences, it is also a source of confusion to many consumers who feel overwhelmed by these choices and react by limiting their purchases to a few familiar and comfortable items. Public education is needed to help consumers utilize a wider variety of seafood products to meet individu-

al preferences, dietary needs, and personal budget constraints.

Seafoods are available to New Yorkers from a variety of sources. Retail outlets for seafood products in New York include restaurants, specialty seafood markets and supermarkets. Many coastal residents also catch fish for home consumption from public, private and commercial facilities. The National Marine Fisheries Service has estimated that over 700,000 saltwater recreational anglers landed 35 million fish in New York in 1986.

Public education efforts designed to help both consumers who purchase seafoods and anglers who eat their own catch are needed to ensure that these resources are used and handled properly to maximize their benefits while minimizing any potential safety risks such as those associated with environmental contaminants in sport caught fish.

Extension has developed seafood utilization programs designed to help consumers effectively select and utilize the seafoods available from both the commercial and recreational fisheries in New York. In order to reach this large and diverse audience, programs have targeted "multiplier groups" that include consumer educators, the media, retail establishments and organized groups who regularly provide information to the public. Examples of multiplier audiences include over 2700 home economics teachers, 180 Cooperative Extension home economists, 450 food and nutrition paraprofessionals and countless other foods and nutrition professionals that serve as consumer educators in some capacity.

Issues

In 1988 the public's attention was dramatically focused on issues of coastal and ocean pollution. Extensive media coverage of marine and other pollution issues has resulted in widespread concern about the environment. This concern was substantiated by a newspaper poll in October 1988 in which Long Islanders identified the environment as

the number one issue in the area. As the public became generally concerned about the condition of New York's marine environment, they also became concerned and confused about the safety of fish and shellfish from that environment. While most safety concerns could not be substantiated by known facts, negative perceptions about the safety of local seafood products have persisted and many individuals, unsure of the facts, have avoided seafoods. It was ironic that, even while the U.S. General Accounting Office issued a report in August 1988 which concluded that seafood illnesses represented only about 5 percent of known food borne illness and, as such, there was no compelling case for a mandatory seafood inspection program, media coverage of issues related to marine pollution, the lack of seafood inspection in the U.S., and routine closures of shellfish harvesting areas were reinforcing negative public perceptions about seafood. The impacts of these negative perceptions were evident in other news stories in which estimates ranging from a 20 to 50 percent decrease in retail sales in Long Island seafood retail markets were reported.

The apparently contradictory nature of widely publicized information on the positive nutritional benefits of seafood versus safety concerns related to marine pollution has created the need for enhanced public education efforts. Objective, accurate information on local and regional seafood safety concerns is needed for widespread distribution to answer immediate questions, and put unfounded fears to rest. Additional information is also needed to help individuals put into a realistic perspective the benefits of seafood consumption while minimizing any potential risks that may be associated with specific products. Public education efforts must also emphasize the variety and diversity of seafood products available in the marketplace that can be utilized in a way that recognizes and acknowledges individual needs and concerns.

Approach

An effective public education effort should include targeted programs directed towards both public and private information provid-

ers. Direct consumer education efforts will utilize public information outlets such as those available through the media, at public events, and through foods and nutrition professionals and educators such as Cooperative Extension agents, consumer groups, or other special interest groups such as sports-fishing clubs. Another significant opportunity for consumer education lies within the retail sector of the seafood industry. Retailers interact directly with seafood consumers on a regular basis and can be an important outlet for consistent factual information if it can be provided to them in ways that are easy to understand and conveyed in a variety of situations. Educational efforts for retailers will be designed both to educate the retailers and their employees, and to provide them with information that can be distributed directly to the public.

In order to continue to provide the public with up-to-date factual information, the results of a variety of continuing research efforts must be evaluated and adapted for easy use by the public education outlets described above. Research developments related to topics such as the role of omega-3 fatty acids in human metabolism, environmental pollution, chemical and biological contamination, new products and production technologies, and handling, storage and distribution systems must be evaluated and presented in ways that can be easily understood by those who stand to benefit by this information.

Objective

- To have food and nutrition professionals in New York utilize and distribute information on seafood nutrition, utilization and safety to the public.
- To have consumers objectively evaluate safety issues raised in the popular press and determine how to select and utilize seafood products to meet individual needs and preferences.

- To have retail and supermarket personnel utilize educational resources to develop effective and accurate consumer education programs in their establishments.
- To provide educational --

References

Fulton Fish Market Information Services
Newsletter. Vol. I, No.2, New York, NY.
March 7, 1988.

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