U. S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES

BUREAU OF COMMERCIAL FISHERIES RESEARCH VESSEL, ALBATROSS IV

A PROGRAM OF FISHERY RESEARCH AND SERVICES

NORTH ATLANTIC REGION

Commissioned at Woods Hole, Massachusetts, May 9, 1963, this new 187 foot stern trawler is especially designed and equipped to carry out fishery oceanographic research.

BUREAU RESEARCH VESSEL, ALBATROSS IV

Created in 1849, the Department of the Interior—America's Department of Natural Resources—is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States—now and in the future.

UNITED STATES DEPARTMENT OF THE INTERIOR, Stewart L. Udall, *Secretary*
FISH AND WILDLIFE SERVICE, Clarence F. Pautzke, *Commissioner*
BUREAU OF COMMERCIAL FISHERIES, Donald L. McKernan, *Director*

A PROGRAM OF FISHERY RESEARCH AND SERVICES NORTH ATLANTIC REGION

REGION 3
BUREAU OF COMMERCIAL FISHERIES
GLOUCESTER, MASSACHUSETTS

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INTRODUCTION

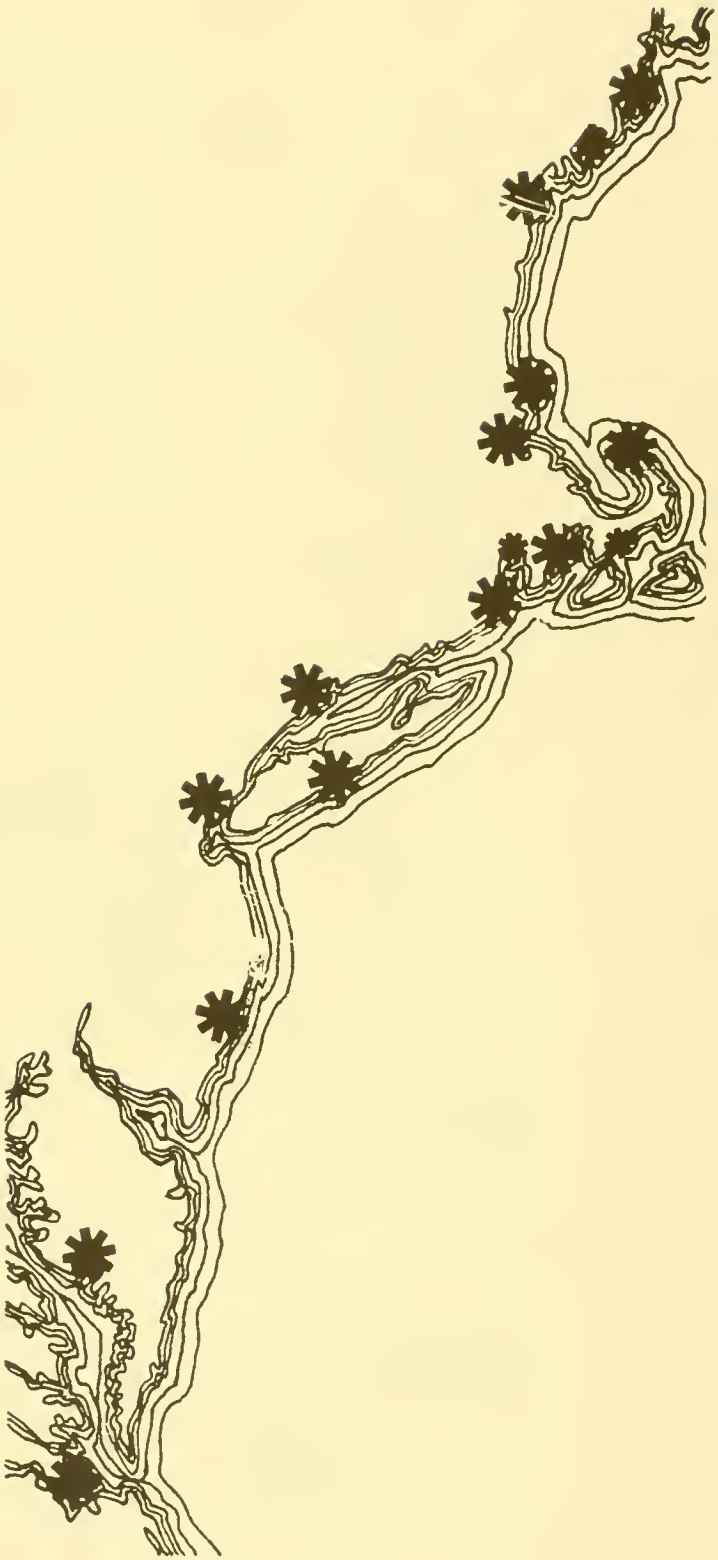
The North Atlantic Region (Region 3) of the Bureau of Commercial Fisheries extends from Maine to Virginia. It includes 13 states with a relatively small total land area of 240,000 square miles, but with a population of 50 million people.

This report outlines the Region's share in the responsibility assigned to the Bureau of Commercial Fisheries by the Congress, "To aid in maintaining the welfare of the fisheries of the United States and its territories by conducting research, investigations, and studies and by providing marketing, informational, and other services for the commercial fishing industry and the general public."

The importance of marine food resources cannot be overemphasized. The fishing industry now furnishes employment, directly and indirectly, for some 500,000 people in the United States. It will become increasingly important as the world's available supply of protein food and the demands of an exploding world population become more and more unbalanced.

The Bureau's plans for the future recognize the need to assist the commercial fishing industry in meeting its immediate and more obvious problems and, even more important, the need to provide long-lasting solutions to fundamental fishery problems. Optimum and judicious use of marine resources will result from longer term programs involving economic, biological, technological, and oceanographic investigations.

This report defines the Region's fishery resources and outlines programs of research and development designed to use these resources more wisely. It also describes the services that need to be provided to an industry upon which, in the future, the Nation must depend for a vital part of its welfare and security.



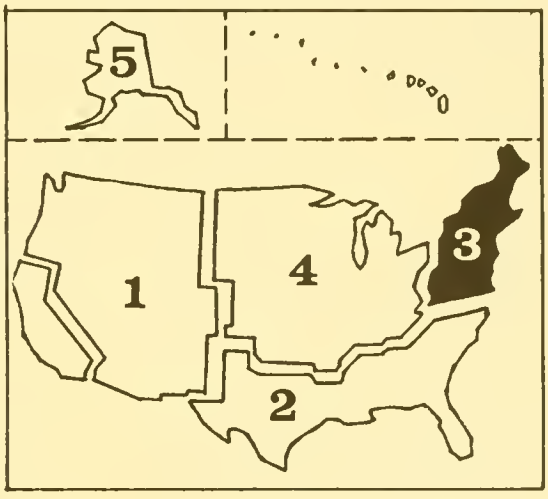
ORGANIZATION OF NORTH ATLANTIC REGION

THE BUREAU OF COMMERCIAL FISHERIES

The Bureau of Commercial Fisheries and the agencies that preceded it have a history of interest in the country's fisheries which extends back to 1871. In 1939, fishery activities were transferred from the U. S. Department of Commerce to the U. S. Department of the Interior and consolidated with the Bureau of Biological Survey to form the Fish and Wildlife Service.

The Fish and Wildlife Act of 1956 provided, in the U. S. Department of the Interior, a Fish and Wildlife Service composed of the Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries. This Act recognized fish and shellfish as a valuable resource, important to the Nation's future. It also directed the Bureau to manage wisely the marine resources and to help maintain a strong and prosperous fishing industry.

As a result of the Fish and Wildlife Act of 1956, the activities of the Bureau of Commercial Fisheries were regionalized to establish closer contact at the field level. The North Atlantic Region was established in November 1957 and, by November 1958, had assumed responsibility for line supervision of Bureau activities in the northeastern States. These responsibilities include the planning, development, direction, and coordination of policies and programs needed in this important fish producing and consuming area.



THE REGIONAL STRUCTURE

The Regional Office, located in Gloucester, Mass., exercises administrative supervision over a broadly diversified group of research and service activities. These programs are designed to secure fundamental information on the resource, improve the harvesting, processing, and use of fish and fishery products, and provide direct technical, economic, statistical, and marketing assistance to the industry. Individual research and service programs are carried out in 7 major laboratories, 12 major field offices, and 17 smaller field stations. Seven vessels are used in coastal and offshore research.

BIOLOGICAL RESEARCH

The biological research programs search for better knowledge of the many factors that influence the movements, abundance, and availability of commercially important fish and shellfish. The laboratory at Woods Hole, Mass., is responsible for studies on trawl fish and sea scallops. Research on the Atlantic herring and soft-shell clams is the specialty of the laboratory located at Booth-

bay Harbor, Maine. The laboratory at Milford, Conn., features research on oysters and hard clams, and the laboratory at Oxford, Md., conducts other molluscan research

EXPLORATORY FISHING AND GEAR RESEARCH

The Exploratory Fishing and Gear Research Base at Gloucester is developing new and more efficient methods of catching fish. Investigations are also made to define and possibly expand the limits of the fishery resource.

TECHNOLOGICAL RESEARCH

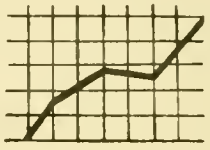
The technological research programs are designed to bring about a more efficient utilization of marine resources either as food or as industrial products. The Technological Laboratory in Gloucester conducts chemical and engineering studies on the handling, storage, composition, and quality of a wide variety of fish and fishery products. The Technological Laboratory at College Park, Md., specializes in chemical and nutritional studies of fishery products and related engineering studies.

TECHNICAL ADVICE

The Technical Advisory Unit, located at Boston, Mass., helps the industrial fishery to find new outlets for fish meal and oil. It maintains close liaison with users and producers of industrial fishery products and keeps them abreast of research developments and product and market opportunities.

MARKETING

Marketing Offices are situated in Boston, Mass., New York, N. Y., and Baltimore, Md. A test kitchen is located at College Park, Md. Research and promotional and educational programs help the fishing industry to sell domestically produced seafoods. Of major importance are radio and television programs, fish cookery demonstrations, recipe development, and consumer publications, motion pictures, and other visual aids.



STATISTICAL SERVICES

A statistical services unit has headquarters in Gloucester and offices in 14 strategic locations throughout the Region. It collects and analyzes information on the production and value of all market forms of commercial fish and shellfish. Special statistical tabulations are prepared for the use of the Bureau's Division of Biological Research and for the International Commission for the Northwest Atlantic Fisheries (ICNAF), one of the many international fishery treaties to which the United States is a party.

MARKET NEWS

Market News offices in Boston, New York City, Baltimore, and Hampton, Va., collect and distribute daily market data on the type, amount, and first sales prices for the fish offered for sale from all the important fisheries of the area. These published reports assist in the orderly marketing of fishery products and aid in determining present and future development of the fisheries

throughout the United States and many parts of the world.

FINANCIAL ASSISTANCE

The Loans and Grants office at Boston administers the Fisheries Loan Fund, the Fishing Vessel Mortgage Insurance Program, and Fishing Vessel Construction Subsidy Program. These programs help bring about a general upgrading of existing vessels and gear and encourage construction of new vessels.

SAFETY AT SEA

The Safety unit, operating from Boston, maintains liaison with industry and insurance companies, demonstrates equipment, and makes surveys aimed at reducing accidents aboard fishing vessels and ashore. This unit is, at present, the only one so far established in the Bureau to specialize in this essential function.

RESOURCE MANAGEMENT

The Resource Management unit, with headquarters in Gloucester, functions as the enforcement arm of the Bureau for the U.S. obligations under the International Commission for the Northwest Atlantic Fisheries.

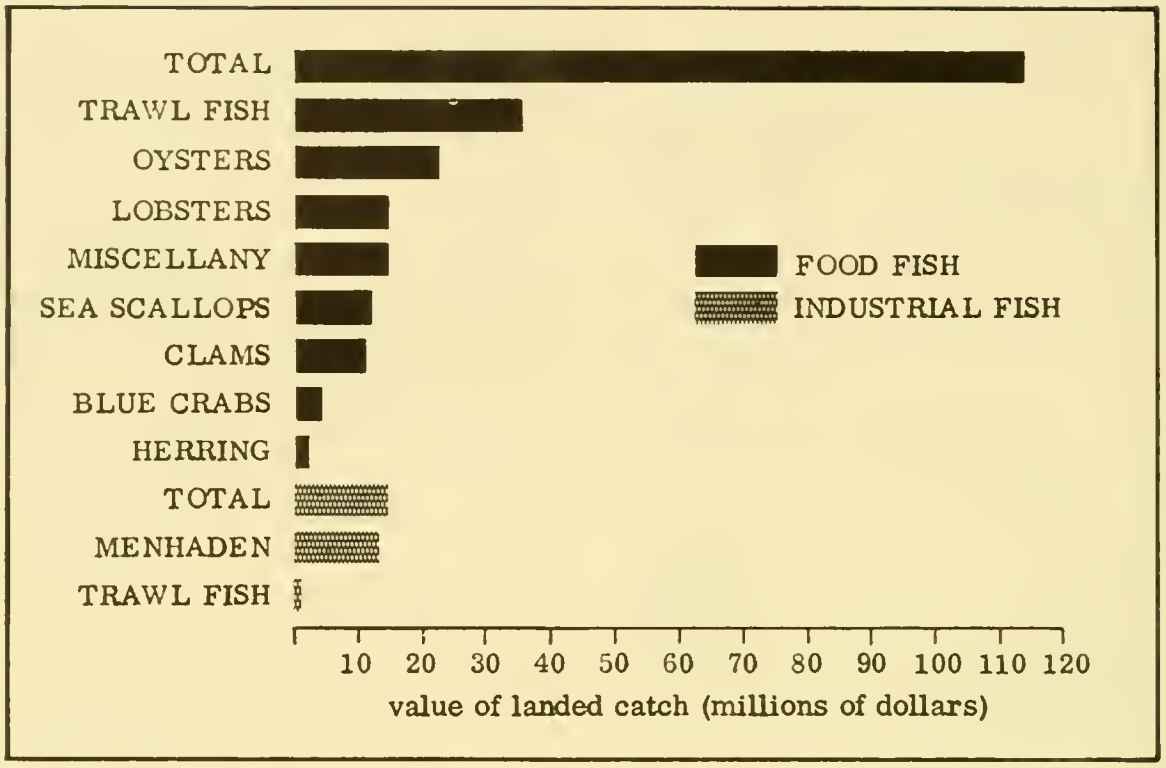
THE FISHERIES TODAY

THE RESOURCE

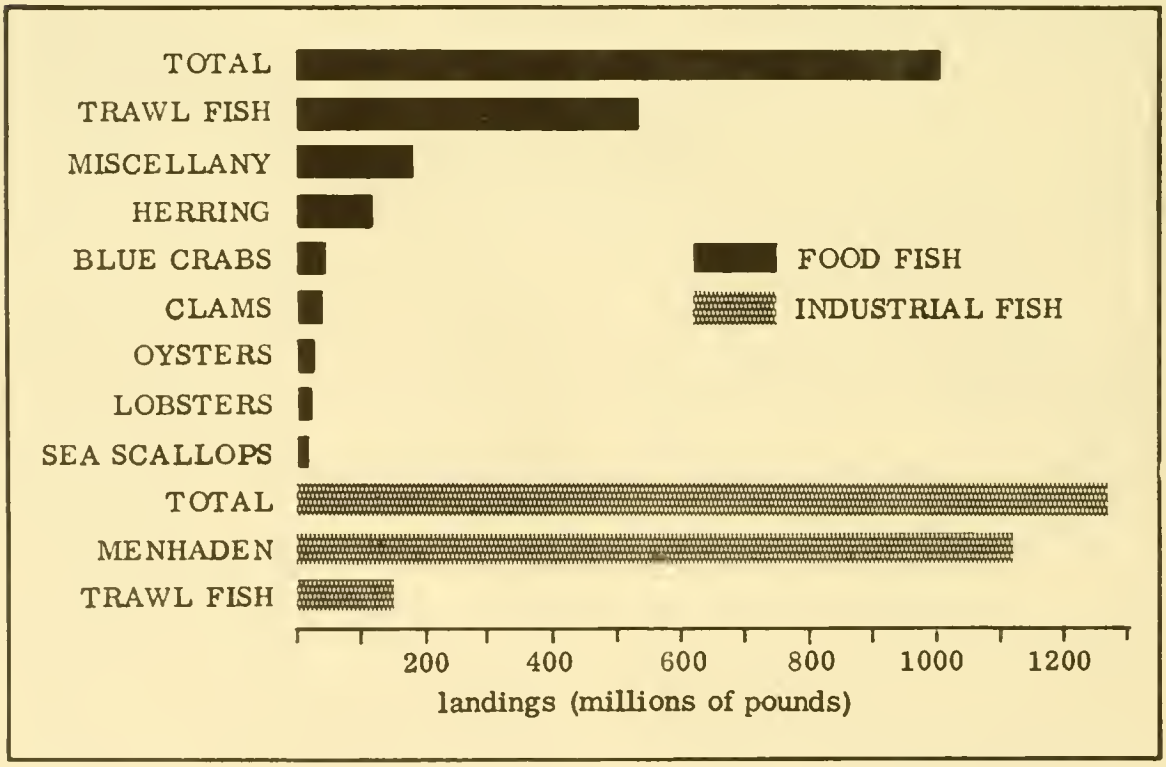
The Continental Shelf and offshore fishing banks upon which the fishing industry in this Region depends are among the richest and most productive in the world. North and east of Cape Cod is Georges Bank, which forms part of the outer edge of the Gulf of Maine basin. It is the home of haddock, sea scallops, and many other less abundant but nonetheless valuable species. Along the Maine coast are lobster and herring fisheries, which make important contributions to the economy of the area. To the east are the Nova Scotian banks and the Grand Bank of Newfoundland, where large quantities of ocean perch, cod, and other species are harvested by the fleets of many nations.

South of Cape Cod, the Continental Shelf supports the large menhaden fishery of the Middle Atlantic and Chesapeake Bay States, as well as the industrial fishery of southern New England and several minor trawl and trap fisheries. In the bays and estuaries from Long Island Sound to Virginia are harvested approximately one-half of the Nation's oyster crop, in addition to clams, crabs, and many species of fin fishes.

To the fishermen of this Region the fish and shellfish harvest is valued at about $118 million, or nearly 33 percent of the value of the Nation's total fishery landings, but in



THE RELATIVE DOLLAR VALUE OF REGION 3 FISHERIES



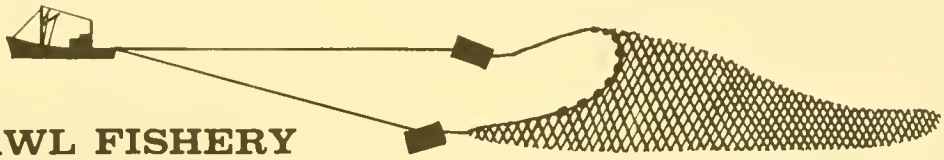
THE RELATIVE LANDINGS OF REGION 3 FISHERIES

terms of weight, about 42 percent of the national total of about 5 billion pounds is landed in Region 3's ports.[1]

Some 90 different species are utilized by the commercial fishing industry in this Region. The major species can be grouped into general categories of trawl fish, menhaden, herring, oysters, sea scallops, clams, blue crabs, and lobsters.

STATUS OF THE INDUSTRY

Several fisheries in the Region are faced with problems of local and national impact.



THE TRAWL FISHERY

The bulk of the food fish harvested in the North Atlantic Region are taken by the otter trawl fishery. U. S. trawlers operate from Cape Hatteras to the Labrador banks, and catch a large share of their fish on the rich Georges Bank in the Gulf of Maine. In New England waters the species taken include haddock, cod, ocean perch, pollock, flounder, fluke, dab, cusk, sole, whiting, red and white hakes, tilefish, sea bass, butterfish, and many others.

Over 1,000 vessels of various sizes are normally occupied in trawl fishing. Approximately 5,000 fishermen man these vessels; about the same number of people handle and process the catch ashore. Thus, about 10,000 people are directly concerned with this fishery. Most of the industry is centered in the New England area. About 80 percent of the trawlers are permanently based in ports north of New York City.

The trawl fishery is subject to large and as yet unpredictable fluctuations in supply. Landings of haddock, ocean perch, cod, and some species of flounders have decreased in recent years. The harvesting of whiting has increased spectacularly, but not enough to offset decreases in other species.

The trawling fleet is dominated by medium-sized otter trawlers, averaging from 51 to 150 gross tons. Many of the vessels are timeworn and obsolete. Since World War II, the fleet has decreased, and boats lost over the years have not been replaced. At present, the average age of the vessels is about 20 years.

On traditionally favored fishing grounds the domestic fishing fleet is also facing increasing competition with fleets of other countries. Increasing numbers of highly mechanized vessels from the U.S.S.R. and other countries are actively fishing in the Gulf of Maine and adjacent waters.

The total production of fillets from domestically caught trawl fish has declined since the early 1950's, whereas imports of frozen fish fillets, blocks, and slabs have increased significantly. The introduction of frozen fish sticks and other specialty products has significantly diversified the processing segment of the industry. But, since most of these products are processed from imported fish, little benefit to the U. S. fisher-

[1] *Fishery Statistics of the United States, 1960* is used throughout this report unless otherwise noted.

men has resulted. The processor who depends upon the U. S. fleet for his supply finds it difficult for his products to compete with imports of equal or superior quality.

The processing segment of the industry is vexed with seasonal and annual fluctuations in supply, high labor and processing costs, and rising foreign competition for the American market. It is difficult for small-plant operators to obtain the capital necessary for plant modernization, product diversification, or for the development of new markets. This has resulted in a radical change in the makeup of the industry. Processing plants depending upon traditional methods, products, and markets are only marginally stable; while those who have fully converted to new sources of supply, have mechanized their operations and diversified their products, are operating at full capacity. The foreign registered freighter and the white-capped and aproned woman attending the mechanized processing lines are replacing the traditional New England trawler and the oil-skinned handler of fish in the plants.

To provide adequate solutions to these problems, there is a need for better definition of the resource, improved harvesting and processing methods, higher product quality, easier financing, and expanded markets.

THE MENHADEN FISHERY

Menhaden support the largest commercial fishery in the United States. Since 1952, the menhaden catch has increased tremendously, reaching a peak of over 1 million tons in 1960, or roughly 41 percent of the Nation's total fish production. This resource is utilized along the Atlantic and Gulf coasts. About 70 percent of the Nation's total landings annually comes from Atlantic waters, and roughly one-half of this is from the waters bordering Region 3. The fishery from Chesapeake Bay northward is seasonal and is confined primarily to the summer when the migrating schools of fish are concentrated in coastal areas.

Menhaden are caught by several types of gear. The vast majority of Atlantic coast menhaden are taken by purse seines. During the early spring, pound nets in Chesapeake Bay and the coastal waters of northern New Jersey and southern Long Island harvest 2 percent of the total catch. There are about 90 purse seine vessels and approximately 2,000 fishermen in the Atlantic fishery. This fishing fleet is augmented by some groundfish trawlers, which are converted for menhaden fishing in seasons when the fish are abundant in New England waters.

From its inception, the menhaden fishery has had great variations in yield. Catches in various areas of the coast differ markedly, both within and between years. Seasons of high production in certain areas often are followed by several years of marginal fishing.

The menhaden industry has increased significantly in size and scope in the past century. Particularly noteworthy is the rapid growth made in the last 10 years. Development of new and more efficient processing equipment has resulted in the construction of new reduction plants and modernization of existing plants. New high-capacity purse seining vessels have been constructed to replace older, less efficient fishing craft. Fishing efficiency has been increased greatly through the use of new and improved gear and aerial scouting. All of these improvements have resulted in a high level of exploitation of available stocks.

At present virtually all menhaden caught are reduced for meal, oil, and condensed solubles. Fish meal is produced in a wet-

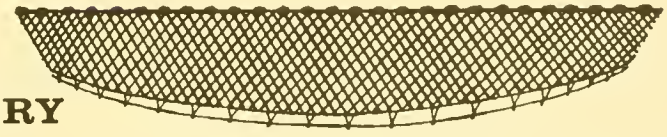
reduction process where cooking, pressing, separation of press liquors, and drying of pressed fish flesh are the principal operations. Removal of fish oil from the press liquors is accomplished by centrifugation or, in some older plants, by gravity separation. When concentrated to a level of 50 percent solids, the remaining press liquors become condensed fish solubles. Processing methods are geared to volume production for maximum economic returns to the manufacturer, thus making small-scale processing unprofitable.

Menhaden fish meal is used almost exclusively as a component of commercial feeds for poultry and swine. The 60 percent protein content of most meals permits efficient high-protein, low-fiber diets. In addition, fish meals are good sources of vitamins and some minerals, and other as yet unknown growth factors. Condensed menhaden solubles are utilized in much the same manner as fish meal and used as a growth supplement to the meal.

Menhaden fish oil formerly was used in large quantities in the manufacture of paints, varnishes, linoleums, inks, soaps, and many other products. In recent years, however, the chemical industry has developed numerous synthetic substitutes for fish oil, so that former markets have decreased to relatively minor importance. The majority of menhaden oil is now exported to Europe where it is hydrogenated and used in manufacturing margarine.

Formerly, domestic markets for fish meal and solubles and foreign markets for fish oil provided a fair financial return to the industry. In recent years, however, imports, competition from lower priced vegetable and land animal meals, and increased production have seriously affected the seemingly healthy economic condition of this industry. European demand for fish oil is now reduced because of the increased availability of foreign produced fish and vegetable oils and heavy exports of U. S. produced soy beans and vegetable oils. Domestic consumption of fish meal and solubles has not increased sufficiently to compensate for the record quantity of meal that is available because of high domestic production and large quantities available for export to world markets. The principal exporting nations are Peru, Angola, South Africa, Canada, Japan, and Norway.

Fluctuations in supply of raw material continue to plague the menhaden industry. Of principal importance, however, is the need to develop new menhaden products and to expand present market outlets.



THE HERRING FISHERY

The sea herring is one of the oldest organized fisheries of the world and presently ranks first in world wide landings. These landings amount to approximately 11.6 billion pounds (FAO—1961), of which the U. S. share usually amounts to less than 300 million pounds, or about 3 percent of the world's total. The greatest portion of the U. S. landings, 152 million pounds, comes from Maine waters.

In comparison with other North Atlantic fisheries, sea herring rank eighth in value and second in tonnage. The herring fishery resembles the menhaden fishery in that, unlike the other principal food fisheries of this Region, both herring and menhaden are harvested in large quantities with much less gear and manpower than are needed for the other principal food species in this Region (i.e., haddock, ocean perch, scup, flounders, whiting, and cod).

The herring fishery is seasonal and utilizes the young herring as "sardines." The present fishery is confined almost exclusively

to the Maine coast and is carried on primarily along the immediate shore with stop seines and fixed weirs. In past years, purse seining has accounted for only a minor part of the catch but more recently has increased in importance.

The sardine canning industry, with about 32 plants along the Maine coast, is the principal user of sea herring. It is a seasonal industry, operating by tradition and State law only between April 15 and December 1.[2] Fluctuations in supply of raw material, as vividly experienced by the failure of the fishery in 1961, are serious and greatly affect the economic condition of the Maine sardine industry.

Processing methods have been changed in recent decades, and the quality of the sardine pack has been improved under an industry-sponsored program. The demand for Maine sardines has remained relatively steady at just under 2 million cases, despite a rapidly expanding national economy and an increased population. Foreign competition has made strong inroads into the sardine market.

There is a need for more knowledge of the basic factors responsible for fluctuations in the herring populations and for the development of improved harvesting methods.

THE OYSTER FISHERY

Oyster landings in Region 3 amount to approximately 8 million bushels, better than half of the total oyster harvest in the United States. The value of these landings to the fisherman is almost $22 million. Oysters represent 50 percent of the total value of all molluscan shellfish harvested in this area. This is about 20 percent of the value of the Region's food fish landings, although only 3 percent of the total poundage. This resource consists of only one species, the eastern oyster.

The oyster fishery is more or less continuous from Cape Cod through Chesapeake Bay. Region 3's southernmost area, including the waters adjacent to the states of Maryland and Virginia, produces 90 percent of the total oyster harvest. Also of importance is the Middle Atlantic area, including beds in Delaware and New Jersey; and the northern area, consisting of waters adjacent to New York, Connecticut, Massachusetts, and Rhode Island.

Three methods are used in harvesting oysters. Approximately 12,000 people use hand tongs, about 3,000 use various types of dredges, and several hundred people employ hand rakes and other manual methods. An estimated additional 6,000 workers are engaged in shucking and processing oysters for market.

Over the past 50 years, the production of the oyster industry in this region has declined seriously because of heavy mortalities from predation and blight, some over exploitation of the resource, and the loss of certain grounds through industrial pollution. The Long Island harvest declined over a period of several years from 10 million pounds per year to less than 1 million pounds in 1960. Since 1957, serious mortalities have greatly accelerated this rate of decline in the Long Island Sound and Delaware Bay areas. Losses in Long Island Sound are due to predator action (starfish and oyster drills) and those in Delaware Bay to an unidentified cause presumed to be the result of a parasitic organism. More recently, an unusually high

[2] In an effort to allow the plants to supplement their one-third normal 1961 canned pack, the Maine State Legislature passed, in December 1961, special legislation authorizing an extension of the season to permit fishing during the normally closed months of December 1961 and January 1 to April 15, 1962.

oyster mortality is also decimating stocks in the rich Chesapeake Bay area, causing severe economic loss.

Because of its inshore habitat and attendant susceptibility to natural and human influences, the oyster is threatened by increasingly heavy mortalities. Sharp decreases in production have increased costs to a point where market demand is affected. Foreign competition and high labor costs present challenges for the future. However, research on diseases, experiments in predator control, introduction of foreign species, and laboratory successes in artificial propagation give reason for an optimistic view to the future. Continuing efforts of both Federal and State research facilities are needed to solve the many problems that now threaten this industry.

THE SEA SCALLOP FISHERY

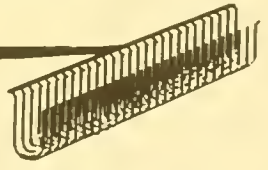
In comparison with other marine products, sea scallops rank quite low in terms of actual pounds landed, but the price-per-pound ranks high in relation to other species. The principal landings of sea scallops are at the port of New Bedford, Mass. Landings for 1960 approximated 26 million pounds of meat valued at about $10 million.

The sea scallop is found on the offshore areas from Cape Hatteras to the Gulf of St. Lawrence, although many local populations are found along the shore areas in depths of about 10 fathoms or more. The offshore fishery, however, accounts for the bulk of the production, with the most productive and consistent supply coming from famed Georges Bank.

The vessels used in the year-round scallop fishery are 60 to 70 feet long and weigh 30 to 70 gross tons. Construction is nearly identical to that of a medium-sized otter trawl dragger. Much of the bottom where the scallops are found is covered with boulders; therefore, very rugged gear is required. Harvesting is accomplished with specially designed dredges which are basically beam trawls with metal rings instead of twine for meshes. Two dredges are normally towed simultaneously. Present vessels and gear appear to be adequate for harvesting the known scallop resource.

For the most part, sea scallops are processed in New Bedford, Mass. They are frozen-processed in two ways; some are simply frozen, and others first breaded and/or cooked.

The scallop industry, generally, has been favored economically. The resource has fluctuated little, and the demand for the product has been good. Within recent years, however, imports, primarily from Canada and Japan, have increased and sea scallop prices have declined. A further adverse development is that foreign fleets are now competing for space on the fishing grounds. The need for development of methods of preserving stocks in the face of this increased fishing pressure is becoming more important.



THE CLAM FISHERY

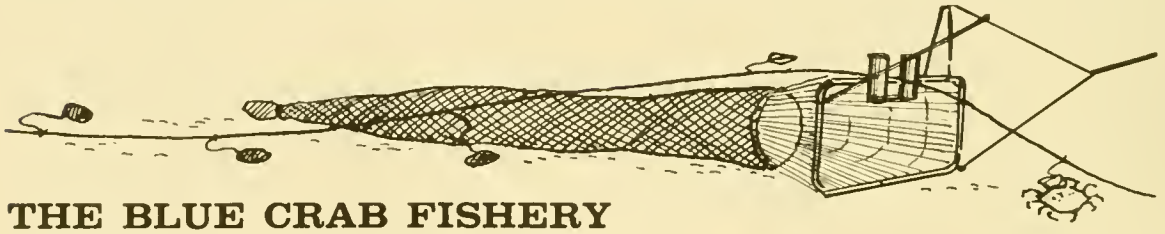
There are three species of clams of commercial importance in the Region: the soft-shell clam, hard clam, and surf clam. Production of soft-shell clams in 1960, harvested primarily in the waters of northern New England and Chesapeake Bay, amounted to

8.6 million pounds of meat, worth $3 million. The hard clam industry, centered in New England and the Middle Atlantic areas, boasts of a production of over 14 million pounds of meats, valued at over $7 million. The relatively new Atlantic Coast surf clam fishery, centered in New Jersey and New York, has the greatest production, consisting of 25 million pounds of meat valued at $1.7 million.

Methods of harvesting and processing clams differ greatly and are influenced by tradition and State regulations. Soft-shell clams are harvested in the tidal areas of New England by hand, but in the Chesapeake Bay they are scooped up from slightly deeper waters by mechanical dredges. Hard clams are taken by a combination of methods, including hand rakes, tongs, and hydraulic and mechanical dredges. Surf clams, found in the deeper waters, are harvested by jet dredges operated by vessels up to 80 feet in length.

The soft-shell clam is marketed primarily as a shucked fresh product, secondarily as "au naturel," and lastly, although in small quantities, as various specialty items. Hard clams are available as fresh in the shell and in various processed forms, of which clam chowder is the most important. Chilled or frozen surf clam meats are used extensively in preparing fried clams, clam chowders, and specialty items.

The condition of the clam industry varies considerably with type of product and area of production. The New England soft-shell clam fishery is faced with a decreasing supply resulting from natural mortalities, industrial pollution, and overexploitation. On the other hand, the recently developed industry of the Chesapeake Bay area is concerned primarily with developing new and diversified markets for its large production. The hard and surf clam fisheries are relatively stable, but there is a definite and immediate need to determine the limits of the resource. Product diversification and development of new preservation methods are needed to expand markets.



THE BLUE CRAB FISHERY

The blue crab industry began in the Chesapeake Bay area sometime in the latter part of the 19th century and since then has been an industry of major importance. The total U. S. catch of blue crabs for 1960 was approximately 155 million pounds, worth slightly more than $9 million to the fishermen. Crab landings in the Chesapeake and Middle Atlantic states amounted to close to 50 percent of the total national landings of blue crabs. Next in order of importance are the South Atlantic and the Gulf areas.

Over 10,000 fishermen harvest blue crabs. This is generally a one-man operation, using small craft with or without limited power. In addition, a large number of people are employed in hand picking the crab meat in 175 to 200 plants ranging from New Jersey to Texas.

The blue crab fishery is subject to large and unpredictable fluctuations in supply. Methods of processing and handling the product vary greatly from plant to plant. Pasteurization of fresh crab meat has improved quality and has permitted more orderly marketing, Considerable hand labor, however, is still used in processing the product, and operations need to be streamlined to reduce costs of production.

THE BUREAU'S PROGRAM OF RESEARCH AND SERVICES

RE-EVALUATION OF REGIONAL ACTIVITIES

As a result of a comprehensive review of its activities in this Region the Bureau of Commercial Fisheries has recently developed the program described in the following pages. This was done with the advice of members of the fishing industry and the States and with full appreciation of the responsibilities of each.

This critical review has led to a program designed to provide more effective utilization of the valuable fisheries resources of the Region. The Regional program outlines the emphasis of Bureau research and service activities under the present organization and plans for future work. It includes biological and technological research programs and service activities designed to strengthen the competitive position of the commercial fishing industry. Many of the fishery problems, however, are so severe that solutions may be long in coming. Breakthroughs in others give ample cause for enthusiasm and encouragement.

RESEARCH PROGRAMS

TRAWL FISH

STUDY OF THE RESOURCE—Investigations are being made to better measure the abundance of the many species in the rich trawl fish resource and predict long- and short-term changes in abundance. Biological surveys of important fishing grounds are underway to provide information on the life history, populations, and migrations of the commercially important species. A new biological research vessel has recently been provided to increase the frequency and regularity of fish distribution and abundance surveys.

More emphasis will be given to oceanographic studies and the development of more precise methods of forecasting abundance of fish populations. Increased studies of the effect of mesh size on fish populations will be made with a view to maintaining adequate stocks in the face of increasing fishing pressure.

IMPROVING FISHING TECHNIQUES—Methods of improving existing trawl fishing techniques are being studied as a part of the Bureau's exploratory fishing and gear research program. Work during the first year of this program will concentrate on evaluating new types of trawl gear and on developing electronic equipment for testing gear performance. The gear research program will be expanded to include work on the introduction of new fishing gear and techniques. Further exploratory fishing studies also will be initiated to better define the limits of this important resource. Surveys of the Continental Slope will be an important

part of this program.

INCREASING USE—Research currently underway at the Bureau's Technological Laboratory in Gloucester on methods of utilizing more effectively the regional trawl fish resources will be intensified. The objectives of these technological studies have been and will continue to be the improvement of the quality of fishery products and the development of new uses for the byproducts of processing trawl-caught fish. During the first year of this program, greater attention will be given to the investigation of quality changes in fresh and frozen fishery products. The development of quality standards and specifications will be continued, as will the basic biochemical research on protein and on flavor and odor. A further intensification of research on fish quality and handling is planned for the future. New preservation methods such as radiation-pasteurization of seafood will be evaluated, and greater attention will be given to fundamental biochemical studies of fish tissue.

MENHADEN

STUDY OF THE RESOURCE—Biological studies of this important resource are the responsibility of the Bureau's Gulf and South Atlantic Region (Region 2). Upon that group falls the major responsibility for measuring and predicting the abundance of menhaden. The studies during the first year of this program will concentrate on population structures, effects of environmental factors on survival of young fish, and biological surveys of estuaries. In the future, tagging experiments will shed more light on fish age, behavior, and movement. Laboratory and field environmental research will also be expanded to furnish more complete biological information on this resource.

DEFINING THE LIMITS—During the first year of the program, exploratory fishing research will better define the limits of the menhaden resource. Systematic surveys of the midwater zones along the Continental Shelf will attempt to establish a year-round menhaden harvest.

DEVELOPING NEW USES—Research on menhaden and menhaden products is conducted at technological laboratories in this Region and in the Bureau's North Pacific Region (Region 1). Nutritional and biochemical studies of industrial products are handled at College Park, while the basic research on fish oils is performed at Seattle, Wash.

Research leading to better methods of utilizing menhaden is an important part of the future program. In Region 3, nutritional, biochemical, and processing studies aimed at increasing the use of fish meal will be continued during the first year of this program. In addition, new methods will be explored for processing many species into a protein concentrate for human use. In Region 1, basic research will be continued on the chemistry of fish oils and on more effective methods of using these important oils. These and other research findings are being brought to the attention of producers, processors, and actual and potential users of menhaden end products so as to expand and diversify markets.

Information is not available on the economic conditions affecting production, distribution, and marketing of menhaden products. An economic analysis of the menhaden industry is planned to provide data that will enable industry to improve its competitive position.

HERRING

STUDIES OF THE RESOURCE —Investigations of the herring resource are conducted at Boothbay Harbor. Research now in progress is aimed at developing serological, biochemical, genetic, and other methods for identifying fish populations. Movements of herring are also being studied through tagging and periodic surveys. Increased emphasis on surveys of larval abundance and distribution is planned. Biological research on this important fishery will be increased in future years to obtain fundamental information that will enable prediction of absolute and relative abundance. Studies of herring diseases and parasites will also be increased.

DEVELOPING GEAR—An effective air curtain device for guiding inshore fish has been developed by Bureau scientists. The future program includes development and evaluation of gear for catching offshore herring. Survey work also is planned to define the limits of the herring resource.

OYSTERS

STUDY OF THE RESOURCE—Present research on oysters at Milford and Oxford is coordinated with the oyster programs of the States of Virginia, Maryland, New Jersey, and Delaware. Investigations are underway to determine the effects of environment, predation, and disease on oyster survival and to find methods of combatting catastrophic losses. At the Milford laboratory research is being continued on the physiology and ecology of the oyster and on methods of artificially growing seed and mature oysters. These programs will be bolstered during the first year by large-scale studies on the use of chemical compounds for controlling oyster predators.

At the laboratory in Oxford research is currently underway on shellfish mortality, culture, and ecological and physiological studies. Expansion of this research to include artificial propagation and advanced culture techniques is planned. Emphasis will be placed on basic studies of oyster biology and techniques for producing disease-resistant strains of seed and mature oysters.

SEA SCALLOPS

STUDY OF THE RESOURCE—At the laboratory in Woods Hole the sea scallop resource is being investigated. During the first year of the program, research will be continued on environmental factors and their relationship to abundance and recruitment. Included also are studies of diseases and parasites and development of methods for managing the valuable sea scallop resource. This research is to be continued in the future.

IMPROVING THE MARKET—The unusually

high production of sea scallops in recent years has introduced new marketing problems. Market research aimed at expanding outlets for this highly nutritious and desirable seafood will be started during the early years of this program. These investigations will provide specific information on the factors affecting the market for this product. Meanwhile the Bureau's marketing service will continue its promotion of this highly attractive product.

CLAMS

STUDY OF THE RESOURCE—More information on the biology of clams is needed to manage this important fishery successfully. Current investigations are limited to resource studies on the soft and hard clams conducted at biological laboratories located at Boothbay Harbor and Milford. Research programs are carried out in close cooperation with State governments. During the first year of this program, the emphasis of the Region's biological investigations will be directed to the little-studied surf clam resource. The first phase of these new surf clam investigations at the Oxford laboratory will include life history, age, and growth studies.

The program also provides for continuation of basic research on hard clams, with emphasis on artificial methods of producing seed and mature clams. Basic laboratory investigations will be carried on to develop new and promising methods of selective breeding.

DEVELOPING MORE EFFICIENT METHODS FOR HARVESTING—Surf clam fishing will be thoroughly reviewed and studied during the first year of this program. Information from these investigations will provide clues for searching new fishing areas and will pinpoint the limits of this important resource. The program for the future also includes research aimed at increasing the efficiency of surf clam fishing methods.

INCREASING USE—Better methods of preserving and processing will extend the present market limits for clams and clam products. During the first year of this program, studies will be made on new methods of extending the keeping quality of clams. These short-term studies should be successfully completed in a few years.

BLUE CRABS

PROCESSING STUDIES—The minimum wage-hour law recently passed by the Congress removed the exemption previously extended to the blue crab processing industry. Increased processing costs have resulted. The Act calls for additional wage increases in 1964 and 1965. If the industry is to remain competitive in the wholesale and retail food market, processing efficiencies must be adopted to reduce the market price of blue crab meat.

During the first year of the Region's blue crab program, research will be undertaken to improve the processing and handling of blue crab meat. The immediate objectives

of this study are to pinpoint costly and inefficient processing practices and to make recommendations for improving processing conditions. Research on automation is a basic program objective.

SERVICE PROGRAMS

Supplementing biological and technological research, the Region's extensive service programs are designed to offset some of the economic problems that handicap the industry.

These programs are concerned with the day-to-day activities of the commercial fishing industry. Market news and statistical services are provided. Marketing assistance is furnished so that domestic fishery products can be marketed in an orderly fashion and supply and demand can be balanced. Financial assistance not otherwise available to vessel owners is provided. Upgrading of vessel safety standards is encouraged to reduce losses and thereby lower insurance rates. The regulations recommended by the International Commission for the Northwest Atlantic Fisheries are enforced.

TECHNICAL ADVISORY UNIT

The first priority function of the Region's Technical Advisory Unit, headquartered at Boston, Mass., is to assist the industrial fishery to find new outlets for fish meal and oil. To determine the end users' needs and to bring these needs to the attention of the industrial fishery, the results of research have been made available to present and potential users of these products.

This activity is expected to expand to ultimately provide similar "extension" or "liaison" services to other fishery groups. Through this better exchange of information on producer-processor-user immediate and long-range needs, the markets for fishery products can be better diversified and stabilized.

STATISTICS

The collection and dissemination of fishery statistical information are routine functions of the Region's Statistical Services unit at Gloucester. This unit collects, analyzes, and publishes data on the regional production and values of all commercial fish and shellfish. Statistics are also collected on fishing craft, employment, volume of processed products, monthly and annual freezings, holdings of frozen fish, and production of fish meal and oil. In addition, special tabulations of catch and operating-unit statistics are prepared for the use of Bureau biologists and for the International Commission for the

Northwest Atlantic Fisheries.

During the first year of this program, collection and publication of statistical information will be maintained at its present level. More effective coverage of biological statistics is planned for the future.

MARKET NEWS

The Region's Market News Service collects and disseminates information on the daily supply, demand, and pricing for fishery products and byproducts. Daily, monthly, annual, and special reports—prepared at offices in Boston, New York City, Hampton, and Baltimore—keep both the industry and Government informed on local, national, and international developments of importance to the commercial fishing industry. No immediate changes are planned in the present market news program. Future plans, however, call for staffing adjustments, improvements in processing and mailing facilities, and increased market coverage, particularly in the processed product field.

MARKET PROMOTION AND TEST KITCHEN RESEARCH

The Region's marketing program assists the industry by facilitating the free flow of domestically produced seafoods through the marketing chain. Marketing specialists, located at Boston, New York, and Baltimore, hold seafood merchandising clinics to acquaint retailers with better methods of merchandising seafood; assist industry in the promotion of fishery products, using TV, radio, and other mass media; and carry out special Government-industry programs such as the annual (fall) "Fish 'n' Seafood Parade" and during Lent. In addition, a staff of trained home economists at College Park performs test kitchen research and develops recipes, both aimed at increasing uses for seafood products.

Market research studies on a contract basis will be undertaken on the principal species, and increased attention will be given to the promotion of trawl fish products. The future program calls for expansion of test kitchen research and the field demonstration schedule.

DIRECT FINANCIAL ASSISTANCE

Programs of direct financial assistance to the industry are administered by the Loans and Grants office in Boston. Under provisions of the loan program, funds can be obtained for financing and refinancing the operation, maintenance, replacement, and repair of fishing gear and vessels and for research on the basic problems of the fisheries. The Fishing Vessel Mortgage Insurance Program insures mortgages and loans, thereby making it easier for industry to obtain capital from private sources. Direct financial assistance for construction of new fishing vessels is provided under the provisions of the Fishing Vessel

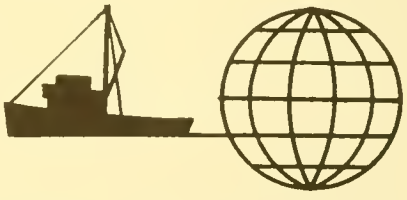
Differential Construction Subsidy Program. Field servicing of applications for loans, mortgage and loan insurance, and vessel construction subsidies will be increased.

RESOURCE MANAGEMENT

The Regional resource management agents, stationed in Gloucester and New Bedford, Mass., and Portland, Maine, are responsible for enforcement of all Federal laws and regulations affecting management of the North Atlantic fisheries. Two species, haddock and cod, are now managed under agreement with the International Commission for the Northwest Atlantic Fisheries. Resource management agents certify trawl nets for use in the fisheries, collect data on use of these nets, and enforce existing regulations. The education of industry in improved management practices is an important part of this program. The present rate of activity will be continued. In the event the Regional ICNAF responsibilities increase, the management activities will be increased proportionately.

SAFETY AT SEA

The Region's Safety Officer, located at Boston, performs services aimed at making commercial fishing a safer enterprise. In addition to providing demonstrations of marine safety equipment this program directly assists industry to establish port safety committees or to adopt other methods of effectively minimizing accidents. Future plans call for broadening the scope of safety activities to permit collection and distribution of data on accidents in the fishing fleet. This information will be used to establish an accident frequency rate for commercial fishing vessels, with the objectives of identifying accident areas and reducing such accidents. By such actions we hope to lessen the extraordinarily high accident insurance rates now in effect.



OTHER ASSISTANCE

In this Region, more assistance is needed in several fields. Building new and modern fishing vessels to replace the present aging fleet should be encouraged. Educational efforts need to be increased to make industry more aware of how research findings can be applied to existing commercial problems. More encouragement should be given to improving the quality of seafood so that both fishermen and processor can receive a higher dollar value for their production. Present methods of quality control must be strengthened so the American public can be assured of receiving an even more delicious product

all the time.

The industry requires more direct assistance in developing new products and in making the homemaker aware of the high value of seafood in the American diet. It is also important that the fishing industry be kept actively informed of international fishery matters so that it can tailor its production to meet changing world conditions. More help is needed, too, in developing foreign markets for domestic seafood and fishery byproducts.

As part of this program, the Region plans to step up its review and appraisal of the economic conditions of the many diverse segments of the industry and recommend appropriate Government assistance to bolster the competitive position of this, America's first industry.

THE FISHING INDUSTRY OF TOMORROW

The President's Special Message on Natural Resources dated February 23, 1961, keynotes the need for a public understanding of the critical importance of wise management of ocean resources if we are to realize maximum continuing benefits from the western North Atlantic. He said, "The sea around us represents one of our most important but least understood and almost wholly undeveloped areas for extending our resource base. . . . Salt (and fresh water) fisheries are among our most important but far from fully-developed reservoirs of protein foods. At present levels of use, this country alone will need an additional 3 billion pounds of fish and shellfish annually by 1980, and many other countries with large-scale protein deficiency can be helped greatly by more extensive use of marine foodstuffs. . . ."

The targets for Region 3 of the Bureau of Commercial Fisheries are wise utilization of the resource and the maintenance of a strong and prosperous commercial fishing industry.

The role of the Region is clear—to insure maximum continuing benefits from ocean resources in the Northwest Atlantic. Such benefits depend on a strong and prosperous fishing industry. The programs outlined in this report represent the best thinking of the Region toward a solution of the industry's problems.

The Region's fishing industry is passing through a critical period of increasing pressure from foreign imports and competition from other protein sources for markets. The vigor and intelligence with which the industry attacks its problems and the degree of direction and assistance that can be provided by the Bureau of Commercial Fisheries may well determine whether the domestic fishing industry will maintain its stature as a major factor in our national economy.

To meet this challenge, the industry of tomorrow must be more efficient, more mechanized, and more aggressive. It must use its raw materials even more wisely. It must exercise teamwork in its marketing and promotion efforts, and its products must be of uniformly high quality.

The Regional program for the future years is designed to provide research and services consistent with the responsibilities of government to help the commercial fishing industry help itself.