TRENDS AND DEVELOPMENTS

Additions to the Fleet of U. S. Fishing Vessels

A total of 35 vessels of 5 net tons and over received their first documents as fishing craft during January 1950--22 less than in January 1949, according to the Bureau of Customs of the Treasury Department. South Carolina led with 7 vessels, followed by Washington with 6 vessels and Massachusetts with 4 vessels.

Vessels Obtaining Their First Documents as Fishing Craft, January 1950 and Comparisons

Section	January 1950	January 1949	Total 1949
	Number	Number	Number
New England	4	2	35
Middle Atlantic	2	1	44
Chesapeake Bay	2	6	87
South Atlantic and Gulf .	16	34	369
Pacific Coast	9	7	327
Great Lakes	-	5	38
Alaska	2	1	96
Hawaii	-	1	5
Unknown	-	-	1
Total	35	57	1,002

Note: Vessels have been assigned to the various sections on the basis of their home port.

Alaska Fishery Research Effort of Fish and Wildlife Service to be Concentrated

The Fish and Wildlife Service's Alaskan Fishery Research Program will concentrate on the pink salmon fishery of Southeastern Alaska, the Director of the Service announced in March. Ten biologists and six assistants will be assigned to this project, and the amount of funds which will be available for the Fiscal Year 1951 for the project is estimated at $100,000.

Director Albert M. Day's detailed statement on this project follows:

BACKGROUND OF ALASKAN FISHERY RESEARCH: During the past 20 odd years during which the Federal Government has been doing fishery research in Alaska, a great deal has been accomplished. The basic information on migration routes, times of spawning, age at maturity, utilization of stream gravels and exploitation by the fishery has been secured. This information has been applied in preparing the annual regulations of fishing activity on the various species of salmon and the herring in the several districts. Although regulation has not been uniformly successful, it has nevertheless resulted at least in preserving a resource which still produces an income of over 100 million dollars per year. Thus, the accomplishments of our research personnel in Alaska, considering the very small appropriations made available to them, have been significant and useful.

Now that the basic information has been gathered there has been a feeling that the continuing research is not on an adequate scale to provide the complete and extensive background of knowledge needed for most effective regulation of the fisheries. The Service's biologists have been as keenly aware of this as have the members of the fishing industry and others who have pointed out the situation from time to time. The basic difficulty seems to be that the amount of research effort which the Fish and Wildlife Service can at present support has been spread too thinly over the complexities of the fishery problems of Alaska and over its vast and relatively inaccessible areas. The solution seems to be equally obvious—the concentration of our effort in one area.

SERVICE WILL CONCENTRATE ON PINK SALMON: In the past we have had four major fishery investigations in Alaska, that of the red salmon in Bristol Bay, the red salmon of the Karluk River, the pink salmon of Southeastern Alaska, and the Alaska herring. All of these fisheries and others (such as the king salmon, coho salmon, chum salmon and pink salmon of Central Alaska) are valuable and in need of further research, so that the problem of selection becomes a difficult one.

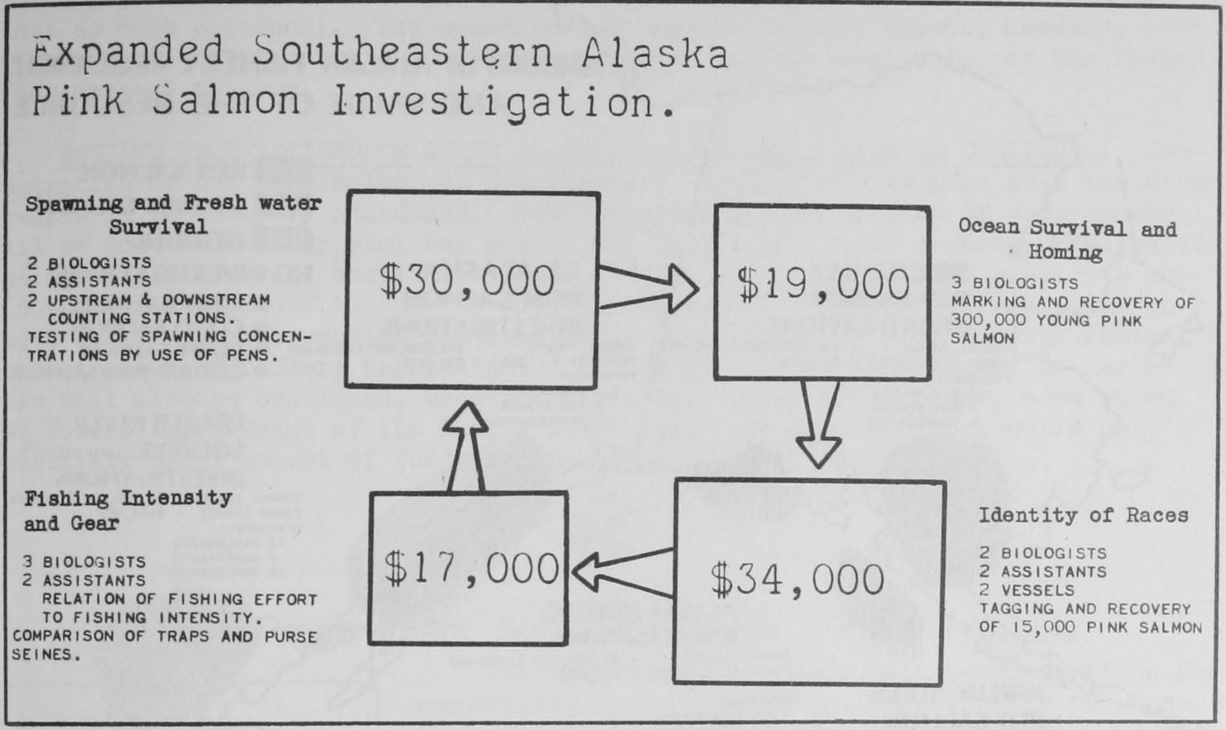
After thorough consideration of all possibilities and consultation with our own biologists and our fishery management experts, I have come to the conclusion that the most profitable fishery for concentration will be that of the pink salmon of Southeastern Alaska. This fishery resource brings in an income of about 18 million dollars a year, but at present only about 36 thousand dollars are being spent annually on research and only one professional biologist is devoting his whole time to the problem. Concentration on this area as compared to concentration on the other fisheries of Alaska would have at least three distinct advantages for the immediate future:

1. The pink salmon has a short life cycle requiring only 2 years for completion as compared with 4 to 6 years for the red salmon. Its fresh-water existence is very brief as compared with the 2 or 3 years spent in fresh-water lakes by the red salmon.
2. The amount of travel required from headquarters in Seattle is only about one-half that required to reach the more distant fisheries in western Alaska.
3. There is a very extensive and well-developed system of fishery management stations in Southeastern Alaska the work of which can be coordinated with that of the proposed expanded pink salmon program to the mutual advantage of each.

EXTENT OF PAST AND FUTURE INVESTIGATIONS OF SOUTHEASTERN ALASKA'S PINK SALMON FISHERY: A considerable amount of information on the Southeastern Alaska pink salmon already has been accumulated as a result of the small-scale investigation of the past and this information will serve as the foundation of the expanded investigation. Tagging work done some years back has indicated the major migration routes while study of meteorological conditions has indicated the factors affecting upstream migrations. At Little Port Walter, operation of a two-way counting weir has given eight years of data on fresh-water survival in one stream. An extensive statistical analysis of trap catches has provided basic information on gear operation.

Under the expanded program to be undertaken as a result of concentration, there will be four major lines of investigation:

1. Spawning and fresh water survival.
2. Ocean survival and homing.
3. Identity of races.
4. Fishing intensity and gear.



Investigations under each of these headings will yield information directly applicable to the problems of fishery management.

Knowledge of fresh-water survival plus that of ocean survival and the climatological variables which affect both will permit the prediction of the return two years hence from any known escapement and will permit the setting of fishing seasons on a reasonable basis. It will also permit the determination of the optimum escapement for each area, which again will provide for proper setting of closed seasons or other gear regulations. Knowledge of the identity of races will permit the regulation of gear in the different fishing areas so that the runs destined for individual parts of the spawning range can be permitted to pass in an amount sufficient for adequate seeding of the gravels in those parts.

Detailed information on the relationship between gear operated and fishing intensity will, of course, be essential for assessments of the correct amount of gear and time of operation. A comparison of the fishing efficiency of traps and purse seines will also be made in order that the records may be kept on a comparable basis as the predominant emphasis shifts from one form of gear to the other.

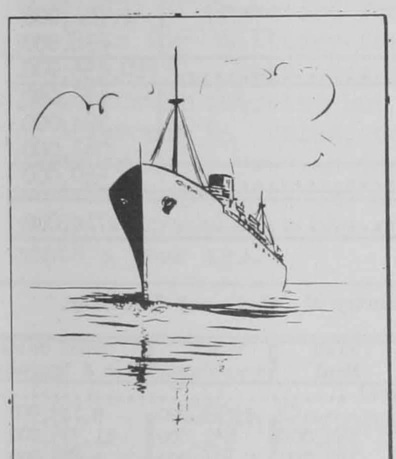
Actual field work will include the operation of six upstream and downstream counting stations instead of just one as was true until 1948. The efficiency of various concentrations of spawning fish will also be extensively studied so that the most desirable concentration for survival can be determined. Ocean survival and homing will be studied by means of marking several thousand pink salmon each year and recovering them later in the catches and in the streams. Identity of races as they pass through the fishery will be determined by tagging and recovering of 15,000 adult fish each year.

The statistical studies of fishing intensity and gear will be greatly expanded and analysis will be possible of many data collected in the past, but not heretofore worked on because of shortage of personnel. These expanded investigations will be pursued during the next few years and there is every hope that they will furnish a solid basis of factual information upon which management of the fishery can be established. Such management should lead to the production of the greatest possible annual pack from the pink salmon resource and the maintenance at the same time of sufficient spawning capacity for the future perpetuation of the individual pink salmon population. This after all is the goal of all elements interested in the salmon fisheries--fishermen, canners and conservationists alike.

Adoption of the program outlined above will funnel into the investigation of the pink salmon of Southeastern Alaska a very respectable amount of research effort. For instance, the full time services of 10 professional biologists will be available instead of the one heretofore employed. Concentrated use of planes, boats and other such facilities will increase the effectiveness of the work even more than an amount proportional to the additional monies diverted to it. For purposes of comparison with this expanded program we can refer to the investigation of the sockeye salmon populations of the Fraser River System carried on by the International Pacific Salmon Fisheries Commission. This research program has been widely acclaimed as representing the successful application of scientific procedures to fishery problems. It is interesting to note that while the Fraser River System covers an area similar to that of Southeastern Alaska, there have in the past been put into it for research about $3\frac{1}{2}$ times as much money and 10 times as much personnel. The concentrated program on pink salmon, however, will bring the amount of money and effort very close to that available for the Fraser River sockeye program.

ROUTINE OBSERVATIONS ON OTHER ALASKAN SALMON AREAS WILL BE CONTINUED: Concentration on the pink salmon of Southeastern Alaska does not mean that the other areas will be entirely abandoned. Routine observations of size of escapements will be continued in Bristol Bay and on the Karluk River and routine sampling of the herring catch will continue. These minimum observations will provide a continuing series for use in case of possible (and much needed) future studies in these areas and will provide the same basis as used in the past for the factual determination of fishery regulations. The fertilization experiments at Karluk Lake will also be continued, because of the very great promise they have shown for future improvement of the Karluk River runs. This work will require only a relatively small amount of funds and personnel.

ECA Procurement Authorizations for Fishery Products



Procurement and reimbursement authorizations for commodities and raw materials announced by the Economic Cooperation Administration during February and March included only one transaction for fishery products--$104,000 to be used for the purchase of canned fish (except shrimp, crab meat, or lobster) from the United States and Possessions for delivery to Belgium-Luxembourg.

A number of revisions and cancellations have taken place in the original authorizations and the revised total authorizations for fishery products (including fish meal and fish and whale oils) from April 1, 1948 (the beginning of the ECA program) through March 31, 1950, amounted to $29,782,000 (see Table 1). Of this total, $13,699,000 was authorized for the purchase of canned fish, $4,088,000 for salted fish, and $11,995,000 for fish meal and fish and whale oils (see Table 2).

Purchases of fishery products in the United States under the ECA program, from its inception through March 31, will total $9,191,000 ($7,063,000 canned fish and $2,128,000 fish and whale oils).

A technical assistance authorization of $30,000 for Korea was announced during February by ECA to be used to provide United States technical engineering services for fishing vessels.

Table 1 - Total ECA Procurement Authorizations for Fishery Products, April 1, 1948 - March 31, 1950			
Commodity	Country of Origin	Recipient Country	Amount Authorized
			U.S.$
FISH (Edible):			
Fish, Canned	U.S. & Possessions	Belgium-Luxembourg	938,000
		Greece	304,000
		Ireland	779,000
		Italy	847,000
		United Kingdom	4,127,000
	Canada (including Newf.)	United Kingdom	6,636,000
Total Canned Fish	....	....	13,631,000
Fish, Salted	Canada (including Newf.)	French West Indies	150,000
		Greece	1,250,000
		Italy	2,688,000
Total Salted Fish	....	....	4,088,000
Total Edible Fish	....	....	17,719,000
BYPRODUCTS:			
Fish and Whale Oils	Norway	Austria	1,216,000
	U.S. & Possessions	France	23,000
	Newfoundland	France	257,000
	U.S. & Possessions	Germany	1,427,000
	Iceland	"	1,693,000
	Norway	"	2,960,000
	Belgium	"	2,201,000
	U.S. & Possessions	Netherlands	678,000
Total	....	....	10,455,000
Fish Meal	Iceland	Austria	183,000
	Canada (including Newf.)	Denmark	394,000
	Norway and Portugal	Germany	963,000
Total	....	....	1,540,000
Grand Total (Edible Fish and Byproducts)			29,714,000

Table 2 - ECA Procurement Authorizations for Fishery Products by Country of Origin and Commodity, April 1, 1948-March 31, 1950							
Country of Origin	Canned Fish	Salted Fish	Total Edible Fish	Fish and Whale Oils	Fish Meal	Total Byproducts	Grand Total Fish & Byproducts
	.... (In U.S. Dollars)						
United States	6,995,000	-	6,995,000	2,128,000	-	2,128,000	9,123,000
Canada (including Newf.)	6,636,000	4,088,000	10,724,000	257,000	394,000	651,000	11,375,000
Iceland	-	-	-	1,693,000	183,000	1,876,000	1,876,000
Belgium	-	-	-	2,201,000	-	2,201,000	2,201,000
Norway	-	-	-	4,176,000	-	4,176,000	4,176,000
Norway and Portugal	-	-	-	-	963,000	963,000	963,000
Total	13,631,000	4,088,000	17,719,000	10,455,000	1,540,000	11,995,000	29,714,000

ECA Advocates Direct Relief for Localities Adversely Affected by Increased Imports

With reference to increased United States imports from European countries, Paul G. Hoffman, Economic Cooperation Administrator, made the following statement before a Joint Session of the Senate Foreign Relations Committee and the House Foreign Affairs Committee on February 21, 1950:

> "ECA has been subjected to some criticism because of its encouragement of increased European exports to the United States, because, it is charged, such increased exports will compete unfairly with domestically-produced goods. A percentage of exports to the U.S.A. which contributes to Europe's dollar earnings are noncom-

petitive in character. A most liberal estimate of the volume of competitive goods that Europe could sell in the United States, even in the year 1953, would be less than a billion and a quarter dollars. This billion and a quarter dollars should be measured against the total production of goods in the U.S.A. of more than $140 billion. Clearly, the absorption of any such amount of competitive goods could not have any appreciable effect upon our total economy. True, this new competition would create problems in a few localities--competition always does; but if there must be some relief in this situation, I suggest that it be given directly. Europe must have dollars to buy goods from us, and if we don't want to give her those dollars, we should let her earn them. Quite apart from the financial aspects of this problem, the relationship between the United States and Europe will never be on a sound basis until Europe is a cash-on-the-barrelhead customer, paying for what she gets."

Federal Purchases of Fishery Products

DEPARTMENT OF THE ARMY, JANUARY 1950: The U. S. Army Quartermaster Corps purchased 1,169,773 pounds (valued at $499,972) of fresh and frozen fishery products for military feeding during January 1950. This was a decline of 18 percent in quantity but an increase of 1 percent in value, compared with December 1949; but an increase of 26 percent in quantity and 45 percent in value, compared with the corresponding month a year ago.

Purchases of Fresh and Frozen Fishery Products by Department of the Army (January 1950 and 1949)

QUANTITY		VALUE	
January		January	
1950	1949	1950	1949
lbs.	lbs.	$	$
1,169,773	931,197	499,972	344,732

Fifth Record-Breaking Tuna Pack Reported for 1949

The tuna pack for 1949 set a new record for the fifth successive year--7,200,000[1/] cases as compared to the 1948 record pack of 7,038,000 cases, which in turn was 1,100,000 cases more than the 1947 record.

In addition to the large pack for 1949, approximately 600,000 cases of canned tuna were imported, principally from Latin America, making a total of approximately 7,800,000 cases available for American consumption.

The average pack of tuna for the years 1935 to 1939 was 2,947,000 cases. Even during the war years (1940-45) the annual pack averaged only 3,400,000 cases.

The 1949 production of tuna would have been considerably greater if fishing had been uninterrupted throughout the year. However, as a result of disagreements between fishermen and canners over the price for tuna, tie-ups occurred in June and July and also during the fall months.

About 90 percent of all tuna canned in the United States in 1949 was canned in California. Most of the other 10 percent was canned in Washington and Oregon.

1/ Standard case of 48 No. 1/2 tuna (7 oz.) cans.

However, East Coast canners who are increasing tuna operations may become a more important factor in the future.

Tuna canned on the West Coast is caught principally off California and in Central and South American waters. However, in recent years, considerable quantities of albacore tuna have been taken off Washington and Oregon.

The operation of floating freezers, some of which have a capacity of over 1,000 tons, has recently been resumed following their tie-up with other boats last year. These ships go to the fishing grounds off Latin America to receive tuna direct from the fishing fleet and then carry the fish north to the canneries. During 1949, one freezer ship brought a load from Japan.

Fish and Wildlife in the National Economy

The role of fish and wildlife in the national economy is discussed in the publication Natural Resources Activity of the Federal Government[1] issued early this year.

In discussing the relation of fish and wildlife to the economic welfare of the nation, the author states:

> The biological subdivision of the natural resources program of the Federal Government has had less systematic formulation and development than any of the major segments of the natural resources field. By comparison, the present program is still restricted and many of its elements lack clarification. Some subdivisions of this field, however, are well marked out. Especially is this the case with the fish and wildlife as related to recreation and sportsmanship, where the federal program is mainly one of research with some positive elements of management coupled with cooperation in state management programs.
>
> The regulation and management of the fisheries in the Alaskan waters and of the Alaskan seal herd is the most completely developed part of the federal program. This is largely due to the dominant responsibility of the Federal Government for all Alaskan affairs, and the special prominence of the biological resource of that area.
>
> Federal inaction has been especially noticeable in commercial offshore fisheries. The states have assumed jurisdiction for some degree of regulation of offshore fisheries, but their responsibility does not usually extend beyond the three, or, at most, the twelve-mile limit. The inactivity of some of the states, the inherent difficulties of their control over a migratory resource, and the location of more than two-thirds of the commercial fisheries beyond the limits of any assumed or implied state jurisdiction provide the setting for either federal activity or neglect of the field. But this is not all; the recent vigorous expansion of fishing on the high seas by many foreign nations may make America's comparative inactivity less tenable for the future. The restricted research and limited economic studies of this resource may not be in keeping with its potential position in the future program for American food resources, especially in light of the extensive program for the promotion and improvement of all other sources of food.

1/ Natural Resources Activity of the Federal Government, (Historical, Descriptive, Analytical), by J. R. Mahoney, Public Affairs Bulletin No. 76, Legislative Reference Service, The Library of Congress, Washington, D. C., January 1950, 249 p., $2.50. (This study was originally prepared for the Task Force on Natural Resources of the Hoover Commission but it was not included among the published documents of the Commission.)

Potential Development of Fishery Resources: Referring to the potential development of fishery resources and indicating that the biological resources are an important part of the expanding economy of our country and of the world, the author points out:

> Conservation of fishery resources will probably require public control, based on scientific knowledge and various measures to promote the highest continuous production at lowest cost that these resources can yield without impairing their productivity. The keystone of the conservation program must be adequate research. The greatest handicap now is lack of knowledge of the location, life processes, and potentialities of this resource.
>
> The recent average yield of the fisheries of the United States and Alaska has been about 4.5 billion pounds annually. This is considerably below the biological potential which Service scientists estimate at about 7 billion pounds under favorable economic conditions.
>
> The application of adequate conservation and management policies would increase the catch of those species that have suffered from overfishing, pollution, and loss of spawning grounds through the construction of dams and for other reasons. Such a policy may increase fish production by as much as 270 million pounds. The major portion of this increase would occur in the North Atlantic and the South Atlantic and Gulf areas where large quantities of small and unutilized species are taken in the trawl fisheries for groundfish and shrimp and might result in a total increase of 325 million pounds.
>
> The yield of a number of well-known species of fish and shellfish can be substantially increased through the intensification of existing fisheries. Production of minor species can also be increased.
>
> The application of farming methods to the growing and harvesting of oysters on depleted beds might result in a gain of 75 million or more pounds of oyster meat annually.
>
> The greatest way open to the increase of the yield of fishery products is through the construction of new modern fishing craft and the development of new grounds and fisheries. It is estimated that full development of new grounds and fisheries available to our fishermen would increase the annual catch by 1,250 million pounds. The largest increases would probably result from an expansion of our North Atlantic fishery for groundfish to the Grand Bank and Davis Straits. Our fishermen now seldom venture beyond Nova Scotia and few if any operate on the Grand Bank of Newfoundland. It is probable that an additional 500 million pounds of groundfish could be taken from these areas.
>
> In 1940 and again in 1941, the Fish and Wildlife Service conducted exploratory fishing operations in Alaskan waters for the purpose of investigating the supply of king crabs. In the search for crabs the expedition found great quantities of flatfish which would support a large fishery. Catches averaged almost a ton to a drag for 240 tows spread over 100,000 square miles of area and single tows as high as 9,000 pounds were recorded. Unexploited grounds where these fish may be taken amount to approximately 600,000 square miles of ocean, of which only about 60,000 square miles are now exploited. There is little basis for estimating the annual production that could be obtained from these waters, but it may average several hundred million pounds annually.
>
> The anchovies of the Pacific Coast are an untapped resource estimated to approach in numbers if not in weight the pilchard population which normally yields one-fourth of our present annual catch. Negligi-

ble quantities of anchovies are now being taken, although it has been estimated that the species is capable of supporting an annual catch of 250 million pounds.

Recent developments have opened to our fishermen an area which may be capable of supplying large quantities of tuna and possibly other varieties of fish. It is known that the Japanese carried on extensive tuna fishing in the Southwest Pacific. Observations by fishery investigators during the war indicate that it may be possible for our fishermen to develop an important tuna fishery in these waters. A million-dollar program to explore Hawaiian and Southwest Pacific waters is being inaugurated by the Service this fiscal year.

In the last 25 years, the fisheries catch has increased from 2.5 billion pounds to about 4.5 billion pounds annually. Whether the catch of fishery products will increase to the maximum level at which it can be maintained is mainly dependent on economic conditions and whether it is considered in the Nation's best interest to obtain additional supplies of fish by increasing our domestic catch or to secure them through imports. If demand and price are maintained at sufficiently high levels to make it profitable to expand production into new fishing areas, construct long-range vessels, and use species now discarded, the total catch can be increased rapidly.

Probably the only example of a fishery resource that has been successfully studied and conserved over most of its range is the Pacific halibut, administered by the International Fisheries Commission since 1930. This is the only fishery conservation agency that has come even close to being adequately supported in money and personnel. The commercial fisheries, taken as a whole, are probably among the least progressive industries in the United States. They are generally slow to improve products, to develop new ones, to exploit virgin resources, to correct wasteful fishing methods or to utilize the whole of their raw material. This backwardness is probably the consequence of its widespread, diffused character. The fishing industries are composed of small, independent enterprises, widely scattered along the extended coast lines; they are concerned with a great diversity of local fisheries and they are beset by a notoriously unstable supply. Most fishery companies must be conservative to survive, and they are generally too small to carry on technological research for developing new fields, except on a very limited scale. In most states, public agencies have not been equipped or staffed to help them. And the Federal Government gives only a fraction of the aid it accords other food industries.

In spite of a growing recognition of the need for regulating the commercial fisheries and for improving techniques of management, depletion of marine fisheries has continued. Some species have been exploited to the vanishing point as, for example, Atlantic salmon and sturgeon. The yields of other species, such as shad and oysters, have been impaired and little has been done to correct the situation.

Certain fundamental investigations are essential if the fisheries of a nation are to be developed to the fullest extent. From 1932 to 1948, the United States had no exploratory fishing vessel and no biological and oceanographical vessel. Having had no facilities for research at sea, little is known about the current status of some of our most important species of marine fish.

The essential elements in a program designed to enlarge this important source of food would include: biological investigations regarding variations in abundance and depletion of important species; technological studies for processing, handling, and distribution of fishery products and by-products; exploratory fishing; economic and statistical studies on production, marketing, prices, investments, labor, and costs; development of inspection, standards and grades; consumer education; improvements in fish culture, fishery management studies; and adequate enforcement in those areas, such as Alaska, where the Department of the Interior promulgates the fishery regulations. The resulting benefits would be restricted without some means to carry to the industry by demonstration, discussion, and printed material, the results of the research program.

The following table illustrates the comparative status of the federal appropriations for the programs in the two subdivisions of our food resources, Agriculture and Fisheries.

Federal Appropriations, 1948		
	Agriculture	Fisheries
Extension work	$ 28,365,000	none
Experiment stations	7,487,000	"
Economic investigations	4,100,000	$ 16,400
Statistical research	10,784,000	67,000
Marketing services	10,493,000	125,000
Commodity exchange	530,000	none
Labor supply program (1947)	12,000,000	"
Marketing agreements and adjustment programs	78,000,000	"
Conservation programs	188,000,000	1,097,000
Promotion of export and domestic consumption	44,000,000	160,000
Crop or harvest insurance	15,000,000	none
Research: basic principles of food production, marketing, distribution	6,000,000	12,000
Biological and technological research	54,500,000	545,000
Rural rehabilitation	97,000,000	none
Electrification	5,000,000	"
Loans and credit:		
Funds invested in corporations	596,000,000	"
Parity price program	274,000,000	"

Other Factors Which Affect Fish and Wildlife Resources: Abatement of the increasing pollution of our inland waters, which is causing tremendous losses in fish and wildlife, will aid in the restoration of our warm and cold water streams and will make essential habitat available to desirable forms of fish and wildlife, according to the author.

In addition, the large-scale programs for the development of the major river basins of the country now in various stages of construction and planning may cause large losses to wildlife and fishing resources, particularly in bottom land areas. The publication evinces that recent studies indicate that if properly coordinated investigations of river basins as a whole are made, a program can be developed which would facilitate the realization of all possible benefits to the many uses, including fish and wildlife resources.

Fishery Biology Notes

"ALBATROSS III" CONDUCTS SURVEYS ON WAY TO NORTH CAROLINA: The Service's North Atlantic Fishery Investigations' vessel, Albatross III, on its Cruise 30

(January 4-13) made a series of hydrographic and exploratory fishing surveys on its way to Morehead City, N. C. It left Woods Hole on January 4 and arrived at Morehead City on January 13.

A total of 1,608 salinity samples were collected; and 655 oxygen, 463 phosphate, and 277 iron determinations were made on board during this cruise.

Survey of New York City Bight: Vessel ran for the vicinity of New York on a course south of Long Island and met the tug Edmond J. Moran and the acid disposal barge Sayreville on the acid disposal area. Followed the barge during the entire dumping period, making acidity and iron determinations in the wake to determine the rate of diffusion of the effluent under winter conditions.

From January 5 through 7 an oceanographic survey was made of the New York City bight, which included Nansen-bottle lowerings; analysis on board of water samples for iron and oxygen content, collection of salinity samples for later analysis in the laboratory; continuous echo-sounder survey on all runs between stations, using two echo-sounding machines; continuous record of surface salinity and temperature; temperature records from surface to bottom; release of 16 drift bottles and 10 drift cards at each of 37 stations.

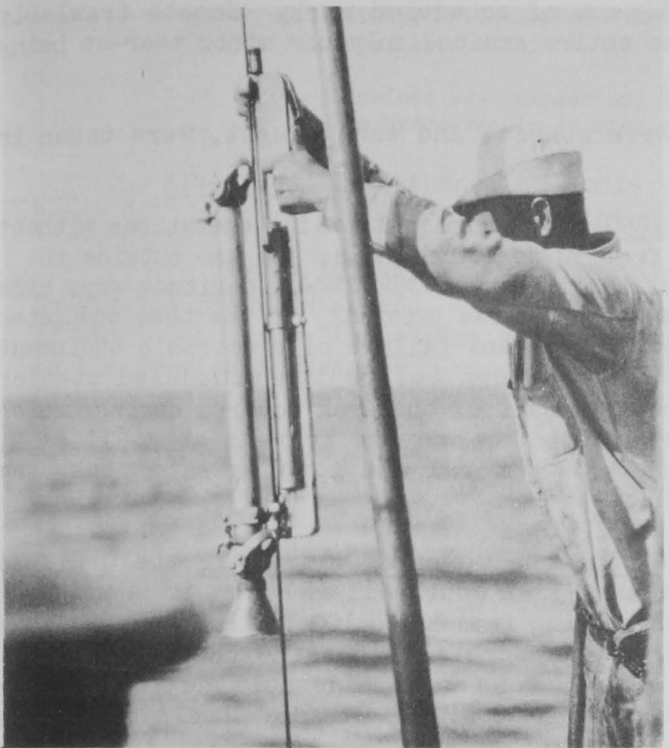
The echo sounder proved to be especially useful since it detected the wake of the barge, and later large schools of fish from one to five miles southeast of Ambrose Lightship. Fishermen who were contacted said they thought these might be mackerel which they had been catching recently. The presence of these schools was reported to fishermen and fishing columnists by radio. The anglers also reported catching haddock in the area in addition to the usual cod.

Survey Off North Carolina: On January 7, the vessel commenced the run south along the coast for North Carolina making salinity and temperature sections across the mouths of Delaware and Chesapeake Bays enroute. Released 8 drift bottles and 5 drift cards at each of the lightships, and took temperature records from surface to bottom.

From January 9 to 13, a detailed oceanographic survey of the North Carolina Coast from the Virginia to the South Carolina borders and between the shore and the 100-fathom contour, and in addition a cross section of the Gulf Stream southeast of Cape Fear were made. This involved continuous salinity and temperature record at the surface; continuous echo-sounder survey using two instruments set for high-intensity reproduction; sea-sampler lowering alternated with an auxiliary-sampler lowering every 20 minutes, and the temperature was also obtained on these lowerings; analysis on board of water samples for oxygen and phosphate content; collection of water samples for later salinity analysis; release of 16 drift bottles and 10 cards at stations located about 15 miles apart; and combined sea-sampler and Nansen-bottle lowerings at stations in the Gulf Stream.

Numerous large schools of fish were detected by the echo sounders. The echos appeared to be from five different species, and judging by the echo-sounder records, which were obtained from fishermen at Beaufort, they included menhaden and croaker. These records were plotted on a chart along with the temperature records at the surface and used as a basis for planning the trawl surveys which followed.

"ALBATROSS III" CONDUCTS EXPLORATORY SURVEY BETWEEN CAPE FEAR AND CAPE HATTERAS OFF NORTH CAROLINA: In order to determine the trawlability (i.e., to determine where trawls can be safely operated) and the available supply of food fishes oc-



TAKING A WATER SAMPLE AND TEMPERATURE WITH GREEN-BIGELOW BOTTLE ABOARD THE ALBATROSS III.

curring on the continental shelf, mainly in depths from 20 to 100 fathoms, between Cape Fear and Cape Hatteras, North Carolina, the Albatross III made four cruises. Data also were collected on many phases of the study of the ocean in the largest combined operation which the Service's North Atlantic Fishery Investigations' vessel has participated in to date. These studies covered ocean currents, basic productivity of the sea in the area, fish parasites, shrimp, chemical composition of invertebrates, and serological studies of fish blood.

A member of the Service's North Pacific Exploratory Program accompanied the vessel on all its trawling cruises as an observer. Several scientists from universities and biological laboratories on the East Coast also were aboard.

Cruise 31A (January 16 to 24, 1950): During this cruise, 45 tows were made with the No. $1\frac{1}{2}$ Iceland otter trawl equipped with rollers and a tickler chain. Tows were made in depths ranging from 20 to 100 fathoms on the continental shelf from 30 to 40 miles south of Cape Lookout to 40 to 45 miles northeast of Cape Hatteras. Only two small tear-ups were experienced.

The catch of commercial species of fish was small except in the vicinity of Cape Hatteras where several large catches of "pin-head" croakers were made. Four hundred and forty-three of these fish were tagged in cooperation with the croaker program of the Middle and South Atlantic Fishery Investigations and cooperating State agencies.

Cruise 31B (January 27 to February 2, 1950): In the large triangular area encompassed within latitude 33°30' N., longitude 78°00' W. and the 100-fathom line, 48 tows (20 with rollers, 28 without rollers) were completed. Three additional tows were made on the western side of Onslow Bay in less than 20 fathoms. Three tear-ups occurred, two about 25 miles SE. x E. of Frying Pan Lightship in 60 to 70 fathoms and an entire net was lost 13 miles N. x E. of Frying Pan Lightship on an uncharted wreck in 17 fathoms.

The catch of commercial species during this cruise, like Cruise 31A, was very small. Several large tows of mixed scup, tomtate, pinfish, and pigfish were caught in the vicinity of Frying Pan Shoals. Many of these fish were below market size, however. Two hundred and sixteen scup were tagged January 29 approximately 30 to 32 miles SW. x S. of Frying Pan Lightship to provide information on their migratory patterns.

Cruise 31C (February 6 to 12, 1950): Forty-one tows, without rollers, covering the continental shelf between 20 to 100 fathoms and one outside the 100-fathom contour from 77°30' W. longitude to 76°30' W. longitude were completed before adverse weather caused curtailment of scheduled work. Smooth trawlable bottom was encountered throughout the entire cruise, only one minor tear-up being experienced.

Fish of commercial importance were scarce, and when caught, were taken in very small quantities.

Cruise 31D (February 16 to 20, 1950): Continuing trawling operations without rollers, 22 tows, in depths ranging from 50 to 100 fathoms, and two outside the 100-fathom contour, between 76°30' W. longitude and 75°50' W. longitude were made during this cruise. Many of the tows were in close proximity to the tows completed during Cruise 31A. Winds of whole gale force and failure of electronic equipment twice forced the *Albatross III* to return to port before the scheduled stations could be completed. However, the southern half of the area covered during Cruise 31A was given adequate coverage; and except for one bad tear-up at 34°11.5' N. latitude and 76°06.5' W. longitude caused by coral and conglomerate rock, the bottom proved to be smooth and trawlable.

Observations on Trawlability of the Area Covered During All the Cruises: A total of 146 tows (53 with rollers and 93 without rollers) was made with the No. $1\frac{1}{2}$ Iceland otter trawl, in depths ranging from 15 to 100 fathoms from latitude 35°00' N. to longitude 78°00' W. Three tows were made outside the 100-fathom contour within this area. In addition, 15 tows were made outside this area—three in Onslow Bay, six between latitude 35°00'N. and Diamond Shoals Lightship, and six about 45 miles NE. of Diamond Shoals Lightship.

In 500 miles of actual trawling operations during the four cruises, only eight tear-ups were experienced, and it can be concluded then, that the continental shelf between 20 and 100 fathoms from Cape Hatteras to Cape Fear is reasonably safe for trawling without rollers.

Notes on the Abundance of Food Fish: The catch of commercially important fish was very disappointing. Small catches (1 to 3 bushels) of vermilion snappers, weakfish, red porgy, white-bone porgy, and isolated groupers; and larger catches (3 to 10 bushels) of scup, tomtate ("red-mouth"), pinfish, and "pin-head" croakers were the best made. These food fishes, except groupers, were most abundant in the vicinity of Frying Pan Shoals and Diamond Shoals, in depths of 15 to 30 fathoms. Groupers, apparently a non-schooling species, were taken in depths over 50 fathoms.

"ALBATROSS III" MAKES SECOND 1950 OCEANOGRAPHIC SURVEY OFF NORTH CAROLINA: The objectives of Cruise 32 made by the *Albatross III* from February 25 through March 6, 1950, were to make a second 1950 oceanographic survey off the North Carolina coast between the shore and points three miles beyond the 100-fathom contour and to obtain a temperature profile along the 71°30' meridian from 150 to 50 fathoms. Observations involved the following:

1. Continuous salinity and temperature records near the surface using the STD apparatus.

2. Continuous echo-sounder survey using two fathometers set for high intensity reproduction.

3. Alternate sea-sampler and bathythermograph lowerings every twenty minutes to a half hour. Each BT to be equipped with a "side-saddle" water sampler and a "scoop-fish" bottom sampler attachment.

4. Release of ten or more drift bottles at each of the prescribed stations.

5. Combined sea-sampler and Nansen-bottle lowerings at one hydrographic station at 32°30' N., 77°16' W.

The Albatross III returned to Woods Hole, Massachusetts, its home port, on March 6.

ATOMIC ENERGY AND SHELLFISHERY RESEARCH: Interest in problems of pollution by fission products arises because of the possibility of widespread utilization of atomic energy in industrial plants, electric power plants, etc., according to the Service's Research Biologist in charge of this project at the Beaufort (North Carolina) Shellfish Laboratory.

The Atomic Energy Commission instigated a number of investigations regarding effects of radioactive waste pollution of air and water on our economy. In respect to effects of such pollution by waste products of industrial nuclear reacters on our fisheries, the Commission entered into two cooperative agreements with the Fish and Wildlife Service. One of these deals with the effect of radiation on fresh-water fishes, and the other concerns the action of radioactive materials on marine forms, particularly marine invertebrates. From the point of view of conservation of our fishery resources the latter is important, for it is concerned with the food chains leading to the higher fishes and man. Any break or interruption in the chain may be quite serious, as the food of the higher forms consists of other forms which, in turn, depend on still other organisms, ending with the small marine plants which obtain their nutrients directly from the environment. At the Beaufort Laboratory, the Service is concerned with this problem of pollution in marine environments.

The first and primary project is a survey of the accumulation and biological life of radioactive materials in invertebrates. While giving an answer to the Atomic Energy Commission on damages to various marine life by possible pollutants, this also gives material for evaluating food chains in all our fishery organisms. The other projects are concerned with problems in production of shellfish, both oysters and clams, of the highest marketable quality.

Radioisotopes of the various elements have proved to be a very important research tool in biology and medicine. By introducing into a compound or food an isotope of an element having an unstable nucleus and emitting radioactive particles or rays, it is possible to follow the metabolism of the tagged compound in the animal body. At Beaufort, the Service plans to use this new research tool for a study of the metabolism of shellfish in order to learn what constitutes food of oysters and clams and how this food is taken in and used by these shellfish. It is anticipated that very valuable information will be obtained that will find application in oyster culture and lead to an increased yield and a better quality product for the oyster industry.

To carry out this work, the activities have been divided into three categories of research. One is research on micro-organisms; it is concerned with small plants and animals that may serve as food. The second category deals with physiology and biology of oysters and clams in regard to mechanisms of feeding and digestion. The third is research on biochemistry of oysters and clams to learn what uses are made of various food materials eaten.

At present, the project is in the organization stage and a building is being remodeled for use as a laboratory. It is anticipated that the project will be actively under way by midyear. Preliminary experiments are being made now on the culture of phytoplankton which may be considered as the starting material in the food chain of higher animals.

REPORT ON THE CLAM RESEARCH PROGRAM: The Service's five-year clam research program is well underway, according to a report from the Chief of Clam Investigations, Boothbay Harbor, Maine.

Soft clam research is centered at Boothbay Harbor, Maine, and Newburyport, Mass. Headquarters of hard clam (quahaug) research is at Kingston, R. I., with projects at Milford, Conn., New Brunswick, N. J., and Beaufort, N. C.

In Maine, Sagadahoc Bay and Robinhood Cove were chosen for intensive studies to learn everything possible of their soft clam populations. Spawning, larval life, currents, temperature, salinity, etc. are being followed to determine factors which cause variations in setting intensity. Marked clams have been planted in various places to determine growth rate and natural mortality. Catch per unit of effort is determined from diggers' records and indicates abundance level of clams. An annual census is taken by sampling to determine number and size composition of clams in each bay. From these data it is expected to predict the number of clams which can be harvested each year while leaving enough for ensuing years. The predicted catch limit will be compared with actual production and correlated with population trends. The States can use methods developed by these studies to manage their clam fisheries on a sustained yield basis.

Depletion of soft clam resources in Massachusetts and New Hampshire has been spectacular. An experimental clam farm, established in Plum Island Sound to determine a practicable method of increasing production, provided a check on relation between variables of environment and survival and quality of clams. Horseshoe crabs invaded the planted areas and destroyed most of the seed. An unexplained mortality killed the remainder. Fencing recently seeded areas, as indicated by an experiment in 1949, may control horseshoe crab predations. Studies will be continued this summer to check the value of this method and to develop others. Pathological studies are in progress on the disease problem. Clams from many areas will be planted to find a disease-resistant strain. Disappearance of soft clams is often blamed on overfishing. Pollution has closed over half of Massachusetts' clam flats and diggers have concentrated on remaining areas. A clam population census of Plum Island Sound was taken and production records are being obtained from dealers. From these data it may be possible to determine if fishing intensity has been great enough to cause the depletion.

Hard clam research studies in Greenwich Bay, Rhode Island, are directed at developing methods for managing the quahaug fishery on a sustained yield basis. Greenwich Bay, which contains about four square miles of quahaug beds below low-tide level and supports 30-50 diggers, will be studied intensively to determine how many quahaugs it can produce yearly. As a part of the problem of regulating the fishery, the Rhode Island Fish and Game Commission asked the Service to determine relative effects of hand versus power methods of fishery. After a survey of Narragansett Bay, the Service selected a three-acre experimental area which the Rhode Island Commission closed to commercial digging. A third of the tract was fished in the summer of 1949 by hand raking; another third was dredged by a commercial power dredge; and the remaining third was held as a control. The same amount of quahaugs was taken from each plot. Following the fishing, under-water photographs and bottom samples were taken in each part of the area to determine the effect of the digging. Dredging and raking will be repeated in the summer of 1950 and the experiment concluded. This work should provide a biological basis for determining whether one method of fishing is more desirable than the other.

Physiological and ecological studies at the Milford, Conn., laboratory of hard and soft clam larvae will give information needed to determine causes of variations in intensity of setting. Successful methods of culturing bivalve larvae developed in this laboratory have led to preparation there of samples, slides and photographs of several species of larvae. These aid greatly in identification of hard and soft clam larvae in field plankton samples.

Cooperative hard clam research with Rutgers University, New Brunswick, N. J., began last summer and will continue in 1950. Studies are being made of ecological factors affecting spawning, larval development, and setting of quahaugs along the New Jersey coast. This fundamental knowledge must be obtained before quahaug farming can be practicable, as a source of seed is the first requirement.

Recently developed methods using radioactive tracers will be applied to clam as well as oyster research. The Beaufort, N. C., shellfish laboratory's investigation of foods, feeding and metabolism of clams will furnish information necessary for evaluating the food supply in different areas and for understanding the fattening process.

THE CHESAPEAKE BAY INSTITUTE: The Chesapeake Bay Institute, sponsored and financed by Maryland and Virginia and the Naval Research Branch of the U. S. Navy, began hydrographical studies of Chesapeake Bay waters in the summer of 1949. This group, affiliated with Johns Hopkins University, established a field headquarters and a laboratory at Annapolis, Maryland. The two boats of the Institute cover the entire Chesapeake Bay and most of its tributaries.

The chief part of its investigations is concerned with water circulation and chemistry. Activities of the Institute complement the biological studies already in progress by the Fish and Wildlife Service and Maryland and Virginia organizations.

REHABILITATION AND MAINTENANCE OF OYSTER PRODUCTION POSSIBLE IN CHESAPEAKE BAY: Rehabilitation and maintenance of oyster production are possible in Chesapeake Bay, states the Chief of the Service's Chesapeake Bay Investigations in discussing the current research program for Maryland.

Brood stock levels, adequate cultch provisions, and harvesting limited to potential productivity must be known and respected. Controlled oyster cultivation must supplant irresponsible free fishing.

What Current Field Exploration Revealed: Current field exploration revealed several features of the Maryland portion of Chesapeake Bay which were either ignored or unknown as factors in oyster production. In the upper part of the Bay, flood waters frequently reduced salt content to dangerously low levels. The affects on oysters were high mortalities, inhibited growth, and retarded development of gonads and meats. As a result of periodic high mortalities and erratic recruitment in this area, many of the bars were reduced to beds of shells. This is veritably a "no oyster's land" because fluctuations in salinity change the environment from fresh water to 15-parts-per-thousand salt within the annual period; often this radical change is accomplished within a few weeks or days.

Inventory surveys were conducted annually throughout Maryland oyster-producing waters and recently in major tributaries of Virginia. The results have given a year by year record on changes in oyster population including recruitment. From these data, gathered over the past ten years by the Department of Tidewater Fisheries of Maryland and the Fish and Wildlife Service, a recruitment potential may be calculated so that a formula composed of natural recruitment, plus planted seed (if needed), minus natural mortality, equals oysters available for commercial harvesting.

To make a program based on this formula function at a level that will permit a planned increase in production, a seed oyster supply of sufficient volume must be developed and maintained. Locations of areas or bars best suited for seed oyster development were disclosed through evidence collected on inventory surveys. At present, four areas are under development. The acreage actually used is small and entirely inadequate to increase production materially. The limitation is not on available acreage, but on available cultch.

Cultch: Shells from shucking houses constitute the bulk of cultch. Under present distribution of shells in Maryland, those available for cultch represent the portion not claimed by road construction, drainage fill, shell grinding for poultry trade, and lime for agricultural use. A further complication in procurement of shells for planting in seed areas is the necessity for the State to purchase them on a competitive market with limited funds allotted for the purpose.

The problem of supplying adequate cultch for meeting an expanding seed requirement demands a substitute for shells or locating untapped sources of shells. The first part of the problem is being studied by determining the efficiency of steel furnace slag, scrap tin, and plaster fragments from discarded broken foundry molds. The second part can be answered by utilizing the vast accumulation of shells in upper Chesapeake Bay as a local source and importing similar unused supplies.

To Stem Destruction and Bring About Rehabilitation of Oyster Beds: To stem destruction of oyster beds and to bring about systematic rehabilitation and increase in commercial production the following investigations were undertaken:

1. Setting: seasonal setting of oysters in several areas of the Bay and tributaries was determined by study of shell bags placed and removed at weekly intervals. Bags were placed well in advance of the earliest possible setting date. Fouling was recorded at the same time the bags were examined for setting of oysters. Distribution of oyster larvae and setting were observed simultaneously in many places.

   The period of maximum setting disclosed in these experiments determined the most effective time for shell planting. This information was incorporated immediately in the State shell-planting program.

   Within promising seed areas, such as Eastern Bay and Holland Straits, exploration of intensity of setting, distribution and survival of larvae, and location of spawners, were observed with relation to water circulation, chemical and physical changes in the water, and physical condition of the bottom. These observations are still in progress.

2. Fouling organisms: the biology of major fouling organisms was studied under the same ecological circumstances. Results of some of these observations helped to determine relationship between successful seed production and failure. Barnacle setting occurred in early spring and reached a maximum by mid-May. To avoid unnecessary fouling by this organism, shell planting was concentrated between May 15 and July 1. Successful results in seed production vindicated the limited period of planting.

   With other fouling, such a clear-cut freedom from shell contamination was not always possible because of similarity of timing of oyster setting and fouling. A method of control was developed through use of DDT treatment of shucking-house shells. Bryozoa, algae and barnacles were inhibited by a film of DDT, while oysters did not materially refrain from setting on these shells if a period of about 4 weeks elapsed before beginning of oyster setting.

3. Rates of growth: oysters have varying rates of growth. A controversy exists concerning whether growth tendency is inherent principally to the individual oyster or to the environment. The first approach made by Mr. Engle's staff was centered on the effect of environment on rate of growth.

   Observations were made on seed oysters from Eastern Bay transplanted to growing grounds in areas having widely separate salinity levels. On the basis of observations conducted for a period of 18 months it seemed that low salinity of about 5 parts per thousand inhibited growth and in salinities from 10 to 30 parts per thousand oyster growth appeared proportional to increase in salinity. Some field evidence demonstrated that the upward change in salinity on one bar would induce a rapid increase in growth of oysters that initially appeared to be stunted. The example occurred in 1943 and 1944 on upper Bay bars. Growth was stopped practically in 1943 and early 1944 when fresh water and low salinity prevailed. A dry summer and fall of 1944 raised the salinity above 10 parts per thousand and oysters with stagnated growth increased over an inch in length and several times in volume.

4. Quality of meats: oysters are valued by the condition of their meats. The fact is well established that a wide range exists in quality of meats frequently in oysters from different parts of one bar as well as over distinctly separated areas.

   A series of observations in Maryland were made to study this fact. The method employed in many investigations to measure condition was the ratio of the dry weight of the meats to the shell cavity. This is a practical measurement for determining commercial gallon yield from the collected bushel. A weakness exists in application of the method to determine exact differences in food quality. In this laboratory it was felt that glycogen is a more reliable measure of difference in quality. Glycogen in oyster varies from bar to bar and from area to area.

Why these differences exist raises also the question of inherent capacity or environmental effect on condition. The environment in two areas in the same immediate locality where oysters have been demonstrated to be different with respect to glycogen is being studied. Results to date fail to show any relationship due to changing salinity and temperature.

Fur-Seal Pups' High Mortality Due to Violent Storms

Hundreds of fur-seal pups were found dead along the coasts of Washington and Oregon after severe storms in January, the U. S. Fish and Wildlife Service announced March 16. In former years, not more than a dozen fur seals (of all ages) have been found washed ashore.

Last summer, the Service tagged 20,000 pups at the Pribilof Islands. Of these tagged pups, 16 were found among the dead animals in the vicinity of Astoria, Tillamook, Newport, and Reedsport in Oregon and on the Washington coast. This is an unusually high percentage of deaths and is an indication that many hundreds of other pups, which were not found, must have died.

The young seals apparently died in the churning seas that accompanied the low temperatures and violent 90-mile-an-hour gales of last January's storms. Like other fur seals, the pups migrate South for the winter, returning to the Pribilofs in the spring. About 3,000,000 fur seals gather in the Pribilofs yearly to breed.

TELEPHOTO SHOT OF BULLS, COWS AND PUPS ON ST. PAUL, PRIBILOF ISLANDS, ALASKA.

Under the protection and management of the Fish and Wildlife Service, the fur seals have increased from a low of 132,000 in 1910.

The present group of year-old seal pups will be ready for harvest in 1952, when the surplus three-year-old males are killed. Although the 1952 take may be reduced, the Service does not expect the loss to affect the fur market. To prevent any drastic fluctuations in supply, a reserve of skins has been built up in past years by the fur company which handles the processing and sale of the skins for the Government.

Pacific Oceanic Fishery Investigations

EXPLORATORY VESSEL "JOHN R. MANNING" ARRIVES AT HONOLULU: The exploratory fishing vessel, *John R. Manning*, arrived at Honolulu on March 26 after an 11-day voyage from San Pedro, California, reports the Service's Pacific Oceanic Fishery Investigations.

Constructed along typical lines of a Pacific Coast purse seiner, the vessel has a cruising range of 8,000 miles and a brine refrigeration system to preserve about 30 tons of tuna for subsequent studies on the quality of fish taken from unexploited areas.

The vessel will engage in a shakedown cruise for a period of about ten days in the vicinity of the Hawaiian Islands to thoroughly test the operation of the fishing gear before departing on a long range cruise. The *John R. Manning* is scheduled to depart about April 20 to the vicinity of the Line Islands to explore for new fishery resources and to conduct studies on how these may be economically exploited.

The fleet of three vessels for the Pacific Oceanic Fishery Investigations is now complete.

School-Lunch Use of Fish Increased by Demonstrations

Following the Fish and Wildlife Service's demonstrations on the use of fish in school lunches, an increase of more than 100 percent has been noted in the frequency and amount of fish that is included in the hot-lunch programs of those public schools where the demonstrations were made.

In Virginia, during 1949, 28 demonstrations were conducted by the Service. In a study of menus of 41 schools which took part in the demonstrations, it was found that the average number of times fish were served had increased 137 percent in November of 1949 as compared with November of 1947. It was also noted that the average number of pounds of fish used in these schools increased 116 percent.

That these increases were the result of work done in schools by the Service is shown by a study of menus of 8 schools selected at random for comparative purposes. These schools had not participated in the demonstration program. From

SERVICE'S HOME ECONOMIST PREPARING FISH FOR A SCHOOL-LUNCH DEMONSTRATION.

these it was found that fish was used an average of 2.2 times in November 1947 and 1.9 times in November 1949, or a decrease of 14 percent. The poundage of fish used, however, showed an increase of 2 percent.

Similar results have been experienced in Georgia and other States where school demonstrations have been held. In addition to Virginia, there were 16 demonstrations given in Massachusetts, 15 in California (principally in the Los Angeles and San Francisco regions), 10 in North Carolina, and 29 in Georgia. Other States where occasional demonstrations were conducted during 1949 were Maryland, Florida, Tennessee, Mississippi, and Washington.

The value of this school lunch educational program lies particularly in the assistance rendered by the marketing specialists in alleviating supply problems, and in acquainting school-lunch personnel and purchasing officers with new and different varieties, cuts, and packs of fishery products. Many school-lunch operators commented on the ease of preparation and increased acceptability of fish prepared by the new and different Service recipes.

In many cases, schools found that operating costs have been reduced through suggestions by the Service to blend more expensive varieties of fish, such as salmon and tuna, with less expensive varieties. An interesting fact was revealed when it was shown that country school children were more receptive to fish than city children--which indicated that rural areas hold good possibilities for fish consumption.

South Atlantic-Gulf Menhaden Fisheries, 1949

The menhaden season ended in February and the total catch for the South Atlantic and Gulf areas is expected to surpass last year's record-breaking catch, according to a report of the Service's Fishery Marketing Specialist making a survey of the area. The continued expansion of the industry in the Gulf accounted for most of the increase. Plants at Morehead City and Beaufort, North Carolina, report a poor season. The fish did not appear in that area, but at Southport (some 100 miles to the south), they had a record-breaking production.

There was increased evidence that the stickwater is being utilized more and more over the entire area.

Oil prices were lower in 1949 than in 1948, and there seems to be little hope that they will be much higher in 1950. Preliminary returns from a few firms show that they received around 35 cents per gallon for menhaden oil (less than 5 cents per pound). However, fish meal prices held up fairly well during 1949, with the bulk going at $140 to $180 per ton. Some producers viewed the 1950 season with some skepticism as a result of large inventories of pork and chicken and lower prices expected for these products.

United States Imports of Fish Nets

The imports of fish nets and netting during 1949 were only 17 percent greater in poundage and 14 percent in value over those for 1948. The volume of otter trawls did not show much increase, but that for cotton fish nets and netting nearly doubled. Gill netting of all kinds decreased in 1949 as compared with the previous year.

Table 1 - U. S. Imports of Otter Trawl and Cotton Netting, 1948-49

Country of Origin	Otter Trawl Nets (Manila Only)				Cotton Fish Nets (does not include under 50¢ a lb.)				Cotton Fish Nets & Netting, All Others			
	1949		1948		1949		1948		1949		1948	
	Lbs.	Val. ($)	Lbs.	Val. ($)	Lbs.	Val. ($)	Lbs.	Val. ($)	Lbs.	Val. ($)	Lbs.	Val. ($)
Canada	-	-	-	-	4,958	8,007	10,742	12,445	105	273	3,070	6,415
Mexico	-	-	19,799	17,420	-	-	-	-	-	-	-	-
United Kingdom	470,009	267,424	462,568	261,947	64	53	3,293	14,451	1	6	-	-
Portugal	-	-	805	443	-	-	-	-	-	-	-	-
France	-	-	-	-	-	-	208	869	-	-	-	-
Belgium	87,521	49,990	11,779	6,953	-	-	-	-	-	-	-	-
Netherlands ...	105,225	58,989	68,512	44,949	17,211	55,076	33,445	63,237	-	-	944	3,262
Denmark	-	-	-	-	400	681	-	-	-	-	-	-
Germany	-	-	4,184	2,522	98	421	268	1,535	-	-	-	-
Japan	37,203	14,910	72,906	31,710	104,042	148,448	29,108	46,214	22,911	13,849	1,023	1,153
China	1,091	388	-	-	-	-	-	-	-	-	-	-
India	-	-	-	-	1,953	5,839	5,957	15,036	-	-	-	-
Total	701,049	391,701	640,553	365,944	128,726	218,525	83,021	153,787	23,017	14,128	5,037	10,930

England remained the main source for trawl nets with the Netherlands in second place. Japan was the principal country to export cotton gill nets and netting.

The imports of linen (flax) gill nets dropped nearly 80 percent from the preceding year, while those for hemp gill nets and other gill netting increased. The volume and value of these items, however, are not significant. (See Commercial Fisheries Review, April 1949, p. 34.)

Table 2 - U. S. Imports of Gill Nets, 1948-49

Country of Origin	Gill Netting, Flax (More than $1.00 a lb.)				Gill Netting, Hemp (More than 60¢ a lb.)				Gill Netting (All Others)			
	1949		1948		1949		1948		1949		1948	
	Lbs.	Val.($)	Lbs.	Val.($)	Lbs.	Val.($)	Lbs.	Val.($)	Lbs.	Val.($)	Lbs.	Val.($)
Canada	347	1,880	1,918	4.524	-	-	140	261	353	2,524	500	400
Mexico	-	-	-	-	-	-	-	-	-	-	10	5
United Kingdom	212	821	1,016	2,144	-	-	-	-	-	-	-	-
France	-	-	-	-	21	60	-	-	116	237	-	-
Netherlands ...	-	-	2,344	8,840	-	-	-	-	-	-	-	-
Italy	-	-	-	-	4,589	5,715	595	659	1,272	409	999	268
Japan	1,806	3,548	5,794	12,090	-	-	-	-	1,160	348	-	-
China	-	-	-	-	720	750	667	600	-	-	-	-
Total	2,365	6,249	11,072	27,598	5,330	6,525	1,402	1,520	2,901	3,518	1,509	673

Wholesale and Retail Prices

WHOLESALE PRICES: Average prices for all commodities at the primary wholesale level advanced slightly during the week of February 14 and were 0.9 percent above four weeks earlier, but 4.0 percent below a year earlier, according to the Bureau of Labor Statistics of the Department of Labor.

All food prices advanced 1.2 percent from January 17, 1950, to February 15, 1950, and were 2.8 percent below mid-February a year ago.

Prices in February this year for all fish and shellfish (fresh, frozen, and canned), on the other hand, were 6.4 percent below January 1950, and 9.4 percent lower than in February 1949. Based on 1947 as 100, the wholesale index for all fishery products was 96.8 for February 1950. Comparing fish and shellfish prices in February with those prevailing a month earlier, the biggest declines occurred in fresh drawn, dressed, or whole (-11.7 percent); processed fresh (-4.6 percent); and canned (-3.8 percent); with a slight increase in processed frozen fish and shellfish (+0.4 percent). Compared with a year earlier, however, prices in February this year were still higher by 10.6 percent on fresh drawn, dressed, or whole; 1.8 percent on processed fresh; 4.5 percent on frozen processed; but 28.4 percent lower on canned fishery products (see Table 1).

Table 1 - Wholesale Average Prices and Indexes of Fish and Shellfish, February 1950

GROUP, SUBGROUP AND ITEM SPECIFICATION	POINT OF PRICING	UNIT	AVERAGE PRICES			INDEXES (1947 = 100)		
			Feb. 1950	Jan. 1950	Feb. 1949	Feb. 1950	Jan. 1950	Feb. 1949
ALL FISH AND SHELLFISH (Fresh, Frozen, and Canned)	-	-	-	-	-	96.8	103.4	106.8
Fresh & Frozen:								
Drawn, Dressed, or Whole:	-	-	-	-	-	109.4	123.9	98.9
Haddock, large offshore, drawn, fresh	Boston	lb.	10.588¢	14.644¢	8.445¢	110.3	152.5	88.0
Halibut, Western, 20/80 lbs., dressed, fresh or frozen	New York City	"	33.2¢	32.7¢	29.4¢	97.0	95.4	85.7
Salmon, king, lge & med., dressed, fresh or frozen	" " "	"	46.9¢	47.0¢	45.4¢	115.1	115.1	111.3
Lake trout, domestic, mostly No. 1, drawn (dressed), fresh	Chicago	"	57.0¢	56.1¢	59.0¢	125.2	123.2	129.6
Whitefish, mostly Lake Superior, drawn (dressed), fresh	"	"	48.5¢	49.6¢	55.0¢	140.2	143.4	159.0
Whitefish, mostly Lake Erie pound net, round, fresh	New York City	"	53.1¢	51.8¢	59.8¢	120.1	117.1	135.1
Yellow pike, mostly Michigan (Lakes Michigan & Huron), round, fresh	" " "	"	46.5¢	45.2¢	54.4¢	108.9	105.8	127.3
Processed, Fresh:	-	-	-	-	-	93.0	97.5	91.4
Fillets, haddock, small, skins on, 20-lb. tins	Boston	lb.	32.8¢	38.4¢	27.2¢	117.9	137.8	97.7
Shrimp, lge (26-30 count), headless, fresh or frozen	New York City	"	63.9¢	63.2¢	64.8¢	92.2	91.2	93.4
Oysters, shucked, standards	Norfolk area	gal.	$3.562	$3.95	$3.50	87.7	97.2	86.2
Processed, frozen:	-	-	-	-	-	102.4	102.0	98.0
Fillets: Flounder (yellowtail), skinless, 10-lb. boxes	Boston	lb.	30.0¢	30.0¢	28.2¢	96.8	96.8	91.2
Haddock, small, 10-lb. cello-pack	"	"	29.5¢	29.0¢	23.9¢	133.5	131.2	108.1
Rosefish, 10-lb. cello-pack	Gloucester	"	21.2¢	21.2¢	21.1¢	106.0	106.0	105.3
Shrimp, lge (26-30 count), 5- to 10-lb. boxes	Chicago	"	63.0¢	63.0¢	64.0¢	91.1	91.1	92.6
Canned:	-	-	-	-	-	88.2	91.6	123.1
Salmon, pink, No. 1 tall (16 oz.), 48 cans per cs.	Seattle	per doz. cans	$3.632	$3.632	$5.848	94.7	102.7	152.5
Tuna, light meat, solid pack, No. ½ tuna (7 oz.), 48 cans per cs.	Los Angeles	per case	$14.25	$14.250	$16.750	92.7	92.7	109.0
Sardines (Pilchards), California, tomato pack, No. 1 oval (15 oz.), 48 cans per cs.	" "	per case	$5.50	$5.50	$7.50	61.5	64.3	83.9
Sardines, Maine, keyless oil, No. ¼ drawn (3¾ oz.), 100 cans per cs.	New York City	per case	$7.50	$7.50	$9.25	73.6	71.1	90.7

NEW INDEX OF WHOLESALE FISH AND SHELLFISH PRICES: A new index of wholesale fishery products prices was released April 12 by the U. S. Department of Labor's Bureau of Labor Statistics. The new index provides, for the first time, a comprehensive measure of monthly changes in the primary market prices of edible American fishery products.

The index is computed from 18 price series (17 of which are supplied by the Fish and Wildlife Service) representing price movements for the major segments of the fisheries industry. Price series for dressed, drawn, or whole fin fish (haddock, halibut, king salmon, two series for whitefish, lake trout and yellow pike) reflect the price movements of fin fish in landed condition. Price series for processed fresh fish and shellfish (haddock fillets, shrimp, and oysters) reflect price movements of fish and shellfish which have been filleted, shucked, etc. Price series for frozen processed fish and shellfish (flounder fillets, haddock fillets, rosefish fillets, and shrimp) reflect price movements of all fish fillets and shellfish which have been frozen or otherwise processed. Price series for canned fish (pink salmon, tuna, California sardines, and Maine sardines) reflect the price movements of all canned and cured fish.

A detailed explanation of the construction of the new index of wholesale fish prices, together with tables of prices and indexes for individual items from January 1948 through February 1950 accompanied the Bureau's publication, Average Wholesale Prices and Index Numbers of Individual Commodities, for February 1950.

The base period (1947=100) for this new index is subject to change at the time when the comprehensive Wholesale Price Index is revised and a new base period adopted.

RETAIL PRICES: The retail food price index on February 15 was 194.8 percent of the 1935-39 average, 2.5 percent lower than a year ago, but 34 percent above the June 1946 level. Between mid-January and mid-February average food prices declined 0.6 percent. Compared with mid-January, February 15 retail prices of meats and poultry were higher, but lower for all fishery products (see Table 2).

Table 2 - Retail Price Indexes for Foods and Fishery Products, February 15, 1950

Item	Index No. (1935-39 = 100)	Percentage change from--	
	Feb.15,1950	Jan.15,1950	Feb.15,1949
All Foods	194.8	-0.6	- 2.5
All Fish and Shellfish (Fresh, Frozen, & Canned)	293.7	-2.7	-10.2
Fresh and Frozen	265.1	-2.6	- 0.8
Canned Salmon: Pink	345.6	-2.9	-25.9

Wholesale Prices of Marine Oils, 1949

Wholesale prices of all marine oils during 1949 were lower than in 1948, according to the Bureau of Agricultural Economics of the Department of Agriculture.

Record wholesale prices were paid for all marine oils (except for Newfoundland cod oil) during 1947, and since that year prices have been declining. Prices for Newfoundland cod oil reached their record high in 1948.

Marine Oils: Wholesale Prices at Specified Markets, Averages 1935-39 and 1937-41, Annual 1943-49

Type of Oil	1949	1948	1947	1946	1945	1944	Average 1937-41	Average 1935-39
	(cents per pound)							
Cod oil, Newfoundland, drums, N. Y.1/	15.9	23.9	6/21.6	6/11.9	11.6	11.8	7.3	5.7
Cod liver oil, medicinal, U.S.P., Norwegian, barrels, N. Y.2/	28.2	34.4	39.5	36.8	32.9	33.6	19.2	11.5
Menhaden oil: Crude, tanks (works), Baltimore	8.0	17.0	6/18.7	11.1	8.9	8.8	4.9	4.4
Light, refined, drums, carlots, N. Y.3/	13.3	21.8	24.9	15.9	13.0	12.6	7.9	7.2
Sardine oil, crude, tanks, Pacific Coast4/	7.6	18.0	6/22.2	11.6	8.9	8.9	5.4	4.8
Sperm oil, natural, 45°, drums, N. Y.5/	18.8	25.4	6/26.9	6/13.1	13.1	13.1	9.3	8.7
Whale oil, refined, bleached winter, drums, N. Y.	-	-	-	6/12.3	12.3	12.3	9.5	8.7

1/Barrels before July 1941. Converted from price per gallon on the basis of 7.5 pounds per gallon.
2/Before June 1944, converted from price per barrel on the basis of 230.4 pounds per barrel. Beginning June 1944, converted from price per gallon on the basis of 7.68 pounds per gallon.
3/Less than carlots, December 1944-December 1948.
4/Before July 1942, converted from price per gallon on the basis of 7.5 pounds per gallon.
5/Quoted as natural before May 1943.
6/Average for less than 12 months.