TRENDS AND DEVELOPMENTS

Alaska

BRISTOL BAY AREA OFFICE SHIFTED TO TOWN OF KING SALMON:

The location of Alaska's commercial fisheries headquarters office for the Bristol Bay area at King Salmon on a year-round basis was announced by the Commissioner of the Alaska Department of Fish and Game on November 1, 1963. Formerly, this office was located at King Salmon during the fishing season and at Dillingham, Alaska, for the remainder of the year.

The reason for the change is due to the fact that King Salmon is more centrally located to the major fishing areas, and living accommodations are now available there for the area biologist. Economy and efficiency will be best served by making King Salmon a permanent station and the area headquarters office.

Two of the four biologists assigned to the Bristol Bay area were to remain at Dillingham.

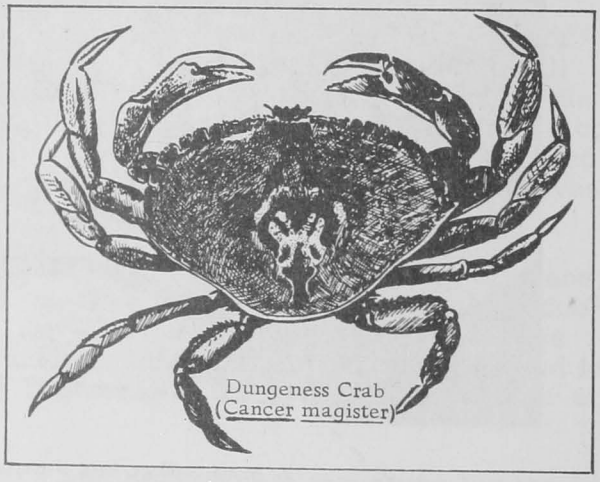
Kenneth R. Middleton, formerly an assistant biologist in the Bristol Bay area, has been named Area Management Biologist. Middleton graduated from the University of California and worked 18 months for the California Department of Fish and Game before joining the Alaska Department of Fish and Game in 1960.

California

ABUNDANCE AND CONDITION OF DUNGENESS CRABS SURVEYED PRIOR TO OPEN SEASON:

M/V "N. B. Scofield" Cruise 63-S-7-Crab (October 5-31, 1963): To determine the preseason abundance and condition of legal and sublegal Dungeness crabs (Cancer magister) were the objectives of this cruise by the California Department of Fish and Game research vessel N. B. Scofield. The area surveyed was in the coastal waters off San Francisco from the Russian River to Point Montara.

Sampling stations were selected randomly from the crab-fishing areas between Point Montara and the Russian River. Commercial crab traps were baited with squid and rockfish and allowed to fish overnight at each of the 71 stations visited.



Dungeness Crab (Cancer magister)

A total of 5,258 crabs were taken in the traps, 3,022 legal males, 2,077 sublegal males, and 159 females. The average legal catch per trap of 4.3 crabs was only slightly higher than the 4.1 legal crabs per trap taken in 1962. The sublegal catch of 2.93 per trap was down from 1962.

The best catches were north of the San Francisco Lightship in 18 and 19 fathoms of water and north of Double Point in 12 to 27 fathoms of water. Good catches were also made west of Point Montara in 16 to 26 fathoms of water.

The mean shoulder width of the crabs was 174 millimeters (6.8 inches), about 3 millimeters (about $\frac{1}{8}$ inch) larger than the mean

shoulder width of the crabs in the comparable survey made in 1962.

According to the survey, it is believed the catch for the 1963/64 season will be 1.4 million pounds with estimates ranging from 1.1 to 1.6 million pounds. The increase in average size was figured into the poundage estimate for the 1963/64 season.

Note: See Commercial Fisheries Review, February 1963 p. 21.

Cans--Shipments for Fishery Products, January-September 1963

The amount of steel and aluminum consumed to make cans shipped to fish- and shellfish canning plants during January-September 1963 was down 3.6 percent from that used during the same period in 1962. The decline was due to smaller shipments to the Eastern and Western Areas which was only partly offset by larger shipments to the Southern Area. The pack of salmon and tuna was down on the West Coast. A smaller pack of Maine sardines accounted for the decline in shipments to the East Coast. On the Gulf Coast, however, there was a considerable increase in the pack of shrimp.

U. S. Domestic Shipments of Metal Cans for Fishery Products, January-September 1963 and 1962
(Base Boxes of Metal Consumed in the Manufacture of Cans for Fishery Products)

Receiving Area	First Quarter		Second Quarter		Third Quarter		Jan.-Sept.	
	1963	1962	1963	1962	1963	1962	1963	1962
East 1/	155,814	158,531	215,924	189,556	276,572	341,193	648,310	689,280
Southern	21,010	13,403	38,197	32,668	34,986	21,765	94,193	67,836
North Central	29	63	5	29	8	22	42	114
West 2/	381,735	414,199	629,376	701,831	594,561	562,140	1,605,672	1,678,170
Total all areas	558,588	586,196	883,502	924,084	906,127	925,120	2,348,217	2,435,400

1/Includes Puerto Rico.
2/Includes Alaska and Hawaii.

In January-September 1963, shipments to the Pacific or Western Area accounted for 68.4 percent of total shipments; shipments to the Eastern Area accounted for 27.6 percent; and shipments to the Southern Area accounted for most of the remaining 4.0 percent. Most of the fish-canning facilities are located in the Pacific Area.

Notes: (1) Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14"x20" size. The tonnage figures for steel (tinplate) cans are derived by use of the factor 21.8 base boxes per short ton of steel. The use of aluminum cans for packing fishery products is small.
(2) See Commercial Fisheries Review, Dec. 1963 p. 24.

Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JULY 1963:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, less fresh and frozen fishery products were purchased in July 1963 by the Defense Subsistence Supply Centers than in the previous month. The decline was 3.5 percent in quantity and 7.7 percent in value.

Compared with the same month a year earlier, purchases in July 1963 were down 5.2

percent in quantity and 24.6 percent in value. Purchases this July included 540,629 pounds of shrimp, 392,098 pounds of ocean perch fillets, 293,486 pounds of scallops, 170,006 pounds of haddock fillets, 166,124 pounds of flounder fillets, 118,429 pounds of oysters, and 86,348 pounds of halibut, as well as substantial quantities of cod fillets, sole fillets, and clams. Prices paid for fresh and frozen fishery products by the Department of Defense in July 1963 averaged 50.9 cents a pound, 2.3 cents a pound less than in the previous month, and 13.1 cents a pound less than in the same month of 1962.

During the first 7 months of 1963, purchases were down 1.5 percent in quantity and 3.8 percent in value from those in the same period of the previous year.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, July 1963 with Comparisons

QUANTITY				VALUE			
July		Jan.-July		July		Jan.-July	
1963	1962	1963	1962	1963	1962	1963	1962
(1,000 Lbs.)				($1,000)			
1,953	2,061	13,831	14,034	995	1,319	7,768	8,081

Canned: Canned tuna was the principal canned fishery product purchased for use of

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, July 1963 with Comparisons

Product	QUANTITY				VALUE			
	July		Jan.-July		July		Jan.-July	
	1963	1962	1963	1962	1963	1962	1963	1962
	(1,000 Lbs.)				($1,000)			
Tuna	174	1	2,064	3,708	81	1/	1,007	2,062
Salmon	2	1	18	1,016	2	1/	12	638
Sardine	24	3	321	53	9	2	131	27

1/Less than $500.

the Armed Forces in July 1963. Total purchases of canned tuna, salmon, and sardines in the first 7 months of 1963 were down 49.7 percent in quantity and 57.8 percent in value from those in the same period of the previous year. The decline was due to lower purchases of canned tuna and salmon.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.
(2) See Commercial Fisheries Review, Nov. 1963 p. 28.

Fish Farming

GEAR TESTED FOR HARVESTING FISH FROM RICE FARM PONDS:

Preliminary trials of a specific commercial type haul seine and seine winch were successfully completed recently in a 36-acre flooded rice field pond near Dumas, Ark. These trials were part of the U.S. Bureau of Commercial Fisheries program to assist the fish-farming industry to improve the methods of harvesting farm pond-reared fish. Catches ranged up to 1,200 pounds of buffalofish and 20 catfish per haul. Over 223 buffalofish, averaging some 5 pounds each, were held alive for two days in a portable water tank to simulate holding the fish for market.

It is felt that with additional refinements, the haul seine and seine winch could be a highly efficient and labor-saving harvesting device particularly for ponds and reservoirs that do not have excessive numbers of snags or similar bottom obstructions. Other advantages of the haul seine gear are: (1) it is unnecessary to lower the pond water level to harvest the fish; and (2) the fish could be obtained for market on shorter notice than with the techniques presently used in the farm pond fishery.

Fish Larvae

FIRST LARVAL FISH BIOLOGY CONFERENCE HELD IN CALIFORNIA:

Tiny and transparent, the vulnerable young or larvae of most important food fishes, such as sardine, herring, tuna, and mackerel are at the mercy of the ocean currents and fair game for predators. These fragile creatures are nevertheless considered by fisheries scientists to be an index of the productivity of the species and an important key to evaluation of any commercial fishery.

At the University of California Conference Center at Lake Arrowhead, October 28-30, 1963, a group of scientists from Scotland, England, Austria, Germany, and the United States gathered to discuss progress in the comparatively unexplored field of larval fish biology. This symposium, sponsored by the U.S. Bureau of Commercial Fisheries Biological Laboratory, La Jolla, Calif., was the highlight of the 1963 California Cooperative Oceanic Fisheries Investigations Conference and attracted researchers from other Bureau laboratories and local colleges and universities.

Contributing papers to the symposium were Mr. F.G.T. Holliday of the University of Aberdeen on the physiology of marine fish larvae; Mr. J.H.S. Blaxter, Marine Laboratory, Aberdeen, on the feeding of herring larvae; Dr. G. Hempel of the University of Hamburg on larval survival; Dr. W. Einsele, Director of the Austrian Freshwater Commercial Fisheries Laboratory at Scharfling on the problems of survival and rearing of European fresh-water fishes; and Mr. James Shelbourne of Lowestoft, England, on the rearing of marine fish for commercial purposes. The United States was represented by Drs. E.H. Ahlstrom, an authority on larval fish taxonomy; Reuben Lasker, who has conducted basic physiological studies on Pacific sardine embryos and larvae; and G.O. Schumann, on behavior of larvae, all from the Bureau's Biological Laboratory at La Jolla; Horst Schwassmann, neuroanatomist of the University of California at Los Angeles, who has studied visual pathways in larval sardines and anchovies; and Professor John Isaacs, Scripps Institution of Oceanography, who explored some basic laws governing the interrelationships of larval sardines and anchovies.

The annual conference on the California Cooperative Oceanic Fisheries Investigations, of which this symposium was a part is spon-

sored by the Federal Government, State conservation agencies, and educational institutions.

Fish Oils

COMPOSITION OF FISH OILS STUDIED BY FRACTIONAL DISTILLATION AND GAS-LIQUID CHROMATOGRAPHY:

Research on the control of chemical alterations in fish and fishery products during storage and processing is being conducted by the U. S. Bureau of Commercial Fisheries Technological Laboratory of Seattle, Wash. One phase, the isolation of highly unsaturated fatty acid fractions will serve the dual purpose of gaining further knowledge of the composition of fish oils and to obtain fractions of the highly unsaturated fatty acids. Some of these fractions are being sent to various laboratories for use in medical, nutritional, and biochemical research problems.

Gas-liquid chromatography of the various distillate fractions of fatty acids provided valuable retention volume data for characterizing certain components of critical pairs in single gas-liquid chromatography column analyses.

Results of these experiments point to the value of low-pressure fractional distillation to readily produce a fraction of polyunsaturated fatty acids from an undistilled residue material. Further work is needed to determine the extent of chemical alterations, if any, to the fatty acid chain and location of double bonds. The experiment has provided valuable qualitative standards for gas-liquid chromatography.

Note: See Commercial Fisheries Review, August 1963 p. 22.

Great Lakes Fishery Investigations

DEPTH DISTRIBUTION STUDIES OF CHUBS AND ASSOCIATED SPECIES IN LAKE MICHIGAN CONTINUED:

M/V "Cisco" Cruise 11 (November 6-15, 1963): To study the bathymetric distribution of coregonids (chubs) and associated species during the fall overturn and to collect materials for electrophoretic and serological studies were the main objectives of this cruise in southeastern Lake Michigan by the U. S. Bureau of Commercial Fisheries research vessel Cisco. Work was interrupted repeatedly by inclement weather.

The water was homothermous from surface to bottom out to a depth of about 25 fathoms. Surface water temperatures were mostly 11.4° to 13.2° C. (52.5° to 55.8° F.) On about the same dates in 1962, water in the same area was approximately 2° C. cooler at the surface and was homothermous out to a depth of 35 fathoms.

One or more bottom trawl tows were made at 5-fathom intervals from 5 to 40 fathoms, and at 3, 7, 12, and 17 fathoms. Fish distribution was noticeably different than in August 1963, the date of the last previous sampling. Appreciably warmer bottom temperatures in the 10- to 25-fathom depth range resulted in a generally deeper distribution of all species except sculpins and alewives, which exhibited no definite change.

Blood and flesh samples for electrophoretic and serological studies were collected from chubs caught in Lake Michigan and from northern pike and white suckers collected in the Kalamazoo River.

Half-meter plankton nets towed at various levels over bottoms of 5, 15, and 25 fathoms did not take fish fry. Filamentous algae and large crustacean zooplankton were scarce at those depths, although a few large cladocerans (Leptodora kindti) were observed.

Notes: (1) The M/V Cisco was assigned to Lake Erie for limnological studies by the U. S. Bureau of Commercial Fisheries during cruise 8 (August 28-September 13) and by the U. S. Public Health Service during cruise 9 (September 24-October 8) and cruise 10 (October 15-29, 1963). Reports on those cruises will not be issued by the Bureau's Biological Laboratory at Ann Arbor, Mich.
(2) See Commercial Fisheries Review, Oct. 1963 p. 21.

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LAKE TROUT DISTRIBUTION STUDIES CONTINUED:

M/V "Siscowet" Cruise 9 (October 14-29, 1963): To assess the spawning population of lake trout in the Apostle Islands region of Lake Superior was the main objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Siscowet. Unseasonably warm and calm weather extended the spawning run into late October, when unspent fish were still found in the cruise area.

A total of 60,300 feet of large-mesh gill nets ($4\frac{1}{2}$- to $6\frac{1}{2}$-inch mesh) fished on spawning

grounds near Gull Island Shoal and south of Basswood Island yielded 235 spawning lake trout, nearly all of which were tagged and released. The catches included 30 females, as compared to 3 spawning females captured during the spawning season of 1962. Six lake trout were recaptured which had been tagged on the same spawning grounds in 1962. Of the 218 lake trout captured on Gull Island Shoal, only 3 (1.4 percent) were fin-clipped. The catches south of Basswood Island (17 fish) included 4 fin-clipped lake trout (23.5 percent).

It was learned that limited fishing by the Wisconsin State Conservation Department in the inshore area of the Apostle Islands yielded 27 spawning lake trout (4 females) of which 7 (25.9 percent) were fin-clipped. The higher incidence of fin-clipped lake trout among the inshore spawning populations suggests that hatchery-reared lake trout may tend to return to areas near the original planting site to spawn.

The lengths of the spawning lake trout captured by the Siscowet ranged from 20.0 to 30.6 inches and averaged 26.4 inches (compared to 25.8 inches in 1962). The 30 females ranged in length from 24.3 to 30.0 inches and averaged 27.8 inches (compared to 29.2 inches for the 3 females taken in 1962). Considerable difficulty was encountered in determining ages of the spawning lake trout. Tentative age determinations for 111 males and 30 females gave the following percentage age distribution: five years, 7.8 percent; 6 years, 26.9 percent; 7 years, 34.8 percent; 8 years, 29.8 percent; and 9 years, 0.7 percent.

Small-mesh gill nets ($1\frac{1}{2}$- and $2\frac{1}{2}$-inch mesh) fished on the spawning grounds caught predominately longnose suckers, with fewer numbers of round whitefish, lake northern chubs, and lake herring. No lake trout eggs were found in the several stomachs examined from each species.

Water temperatures were unseasonably high throughout the cruise. Surface temperatures ranged from 12° C. (53.6° F.) south of Basswood Island to 13.4° C. (56.1° F.) on Gull Island Shoal.

Note: See Commercial Fisheries Review, Dec. 1963 p. 26.

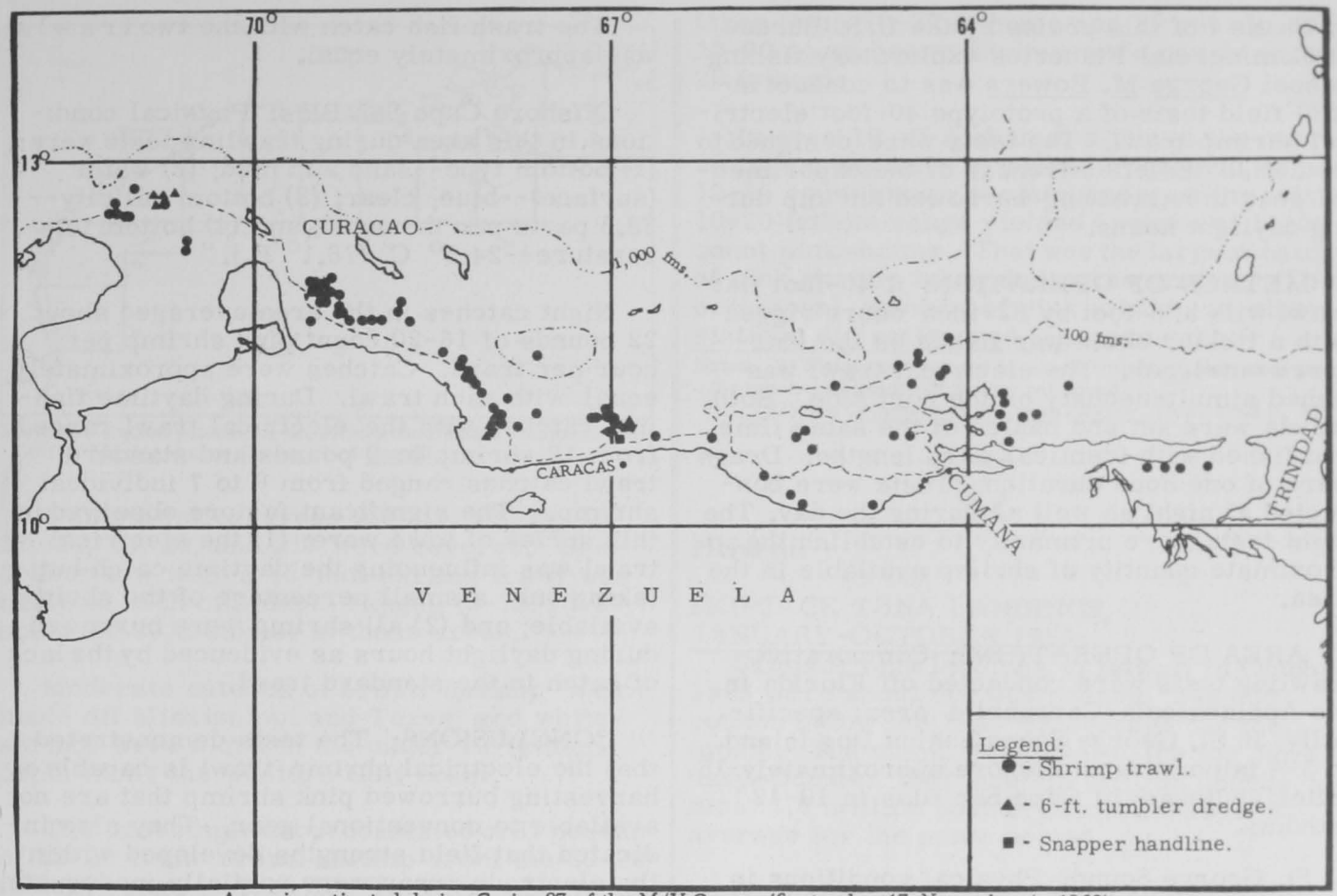
Gulf Exploratory Fishery Program

PRELIMINARY SURVEY OFF THE COAST OF VENEZUELA:

M/V "Oregon" Cruise 87 (September 17-November 4, 1963): The primary purpose of this 48-day cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon was to conduct a preliminary survey of the resources of the Continental Shelf and Slope off the Caribbean coast of Venezuela. That area had constituted one of the largest gaps in exploratory fishing coverage of the Caribbean. Transects were run across the shelf and slope from 30 to 100 fathoms in international waters between the Gulf of Venezuela and Caracas (Venezuela), and from 5 to 700 fathoms between Caracas and Trinidad. Four additional drags were made in the Gulf of Paria. Port calls were made at Williamstad, Curacao; LaGuiara and Cumana, Venezuela; and Port of Spain, Trinidad.

From the Gulf of Venezuela to Caracas, depths shallower than 100 fathoms were marked generally by rough bottom conditions, and considerable gear damage was experienced. A few successful drags, with trawls rigged with mud rollers, resulted in catches of pink and brown shrimp (Penaeus duorarum and P. braziliensis) in amounts less than 10 pounds per drag, and in 10- to 25-pound catches of 0.5- to 3.0-pound lane snapper and vermilion snapper. One drag east of the Gulf of Venezuela produced a catch of 50 pounds of 3- to 8-pound scamp (Myctoperca falcata). Fishing for snapper with roller-rigged fish trawls might be more productive than shrimp trawl results indicate in the general area inside 100 fathoms from the mouth of the Gulf of Venezuela to the Golfo de Triste.

Extensive areas suitable for trawling were found in the 200- to 600-fathom depth range along the eastern edge of Pena Paraguana and from Punta Zamuro to the Golfo de Triste. Royal-red shrimp (Hymenopenaeus robustus) were taken in small numbers from 200 to 400 fathoms. The best catches amounted to 25 to 45 pounds (heads-on) per 3-hour drag and occurred between 220 and 240 fathoms where water temperatures averaged 10° C. (50° F.). Due to the presence of small finger coral over much of that depth range, the use of mud rollers was obligatory, but gear damage was slight. The pink speckled shrimp, Penaeopsis megalops, was also present on the slope in depths of 180-230 fathoms, with the heaviest



Areas investigated during Cruise 87 of the M/V Oregon (September 17-November 4, 1963).

concentrations in 200-225 fathoms. One drag in 225 fathoms took 150 pounds (heads-on) of pink speckled shrimp. Also present in deeper drags, but generally in quantities less than 15 pounds per drag, were the scarlet prawn (Plesiopenaeus edwardsianus), two additional penaeids--Aristaeomorpha foliacea and Aristeus antillensis--and the striped pandalid shrimp (Plesionika longipes). Fish catches in deep water were lower than catches in comparable depths and temperatues in the Gulf of Mexico or off the east coast of the United States In those areas, whiting (Urophycis) and hake (Merluccius) often dominate the fish catches on royal-red shrimp grounds, but such species were markedly less abundant off Venezuela where rattail fish (Macrouridae) dominated many catches and were represented by at least 19 species.

Trawling east of Caracas was confined largely to shelf depths, except for transects across the enclosed basin near Margarita Island. Those transects, running from 100 to 700 fathoms, indicated that the basin is devoid of life in its deeper depths, due probably to anaerobic conditions. Drags on the shelf inside 20 fathoms produced small to moderate catches of croakers (Micropogon) and other sciaenids and small catches of lane and vermilion snappers. Efforts to locate concentrations of the South American white shrimp, Penaeus schmitti, were unsuccessful along the Caribbean coast, and only small numbers were found in the limited work accomplished in the Gulf of Paria. Dredge drags between Isla Tortugas and the mainland of Venezuela yielded small numbers of scallops which resembled the calico scallop of the Gulf of Mexico. The largest scallop catch was 25 pounds, with other catches averaging less than 2 pounds.

Trolling lines and a careful bridge watch to detect surface schooling tuna were maintained when the vessel was running. Few schools were seen. One unsuccessful attempt was made to sample a school of blackfin tuna in the mid-Caribbean with a 6-inch monofilament gill net.

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SHRIMP GEAR STUDIES CONTINUED:

M/V "George M. Bowers" Cruise 48--Phase I (October 14-25, 1963): The purpose

of Phase I of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers was to conduct initial field tests of a prototype 40-foot electrical shrimp trawl. The tests were designed to establish the effectiveness of the experimental gear in harvesting burrowed shrimp during daylight hours.

METHOD OF OPERATION: A 40-foot flat trawl with a 6-foot by 32-inch doors rigged with a tickler chain was fished on the starboard outrigger. The electrical trawl was fished simultaneously on the port side. Both trawls were set and hauled at the same time and fished with identical warp lengths. Drags were of one hour duration. Tests were conducted at night as well as during the day. The night tests were primarily to establish the approximate quantity of shrimp available in the area.

AREA OF OPERATIONS: Comparative trawling tests were conducted off Florida in the Apalachicola-Carrabelle area; specifically, in St. George Sound behind Dog Island in 3-4 fathoms and offshore approximately 15 miles southeast of Cape San Blas in 10-12 fathoms.

St. George Sound: Physical conditions in this area during trawling tests were: (1) bottom type--brown mud; (2) water condition (surface)--green, turbid; (3) bottom salinity--33-35 parts per thousand; and (4) bottom temperature--22.5° -23.3° C. (72.5° -73.9° F.).

Night catches in the area averaged about 30 pounds of 31-35 count pink shrimp per hour in each trawl. The night catches with the electrical gear were slightly greater than with the standard trawl.

During the day, catches with the electrical trawl ranged from 19 to $36\frac{1}{2}$ pounds whereas the standard trawl catches ranged from $8\frac{1}{4}$ to $14\frac{1}{2}$ pounds. The ratio of electrical to standard catch on each drag ranged from 1.5:1 to 3.8:1. The 3 significant factors noted in this series of 15 paired drags were: (1) the electrical gear was producing significantly greater catches than the standard trawl during daylight hours; (2) the electrical gear was not producing daylight catches as large as those taken at night with either trawl i.e., it was not taking all the shrimp available; and (3) the entire shrimp population was not burrowed during the day because daytime catches were made with the standard trawl.

The trash fish catch with the two trawls was approximately equal.

Offshore Cape San Blas: Physical conditions in this area during trawling tests were: (1) bottom type--sand and mud; (2) water (surface)--blue, clear; (3) bottom salinity--38.5 parts per thousand; and (4) bottom temperature--24.5° C. (76.1° F.).

Night catches in the area averaged about 22 pounds of 16-20 count pink shrimp per hour per trawl. Catches were approximately equal with each trawl. During daytime fishing, catches with the electrical trawl ranged from 12 shrimp to 9 pounds and standard trawl catches ranged from 0 to 7 individual shrimp. The significant factors observed in this series of tows were: (1) the electrical trawl was influencing the daytime catch but taking only a small percentage of the shrimp available; and (2) all shrimp were burrowed during daylight hours as evidenced by the lack of catch in the standard trawl.

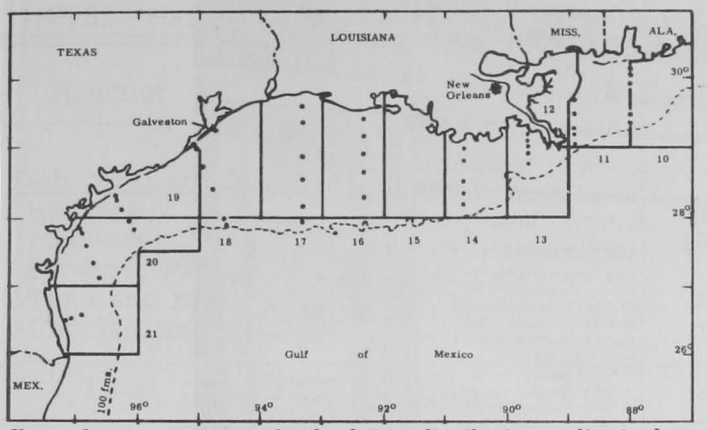
CONCLUSIONS: The tests demonstrated that the electrical shrimp trawl is capable of harvesting burrowed pink shrimp that are not available to conventional gear. They also indicated that field strengths developed within the electrode array were partially inadequate. This was particularly evident on the high salinity offshore grounds. Additional laboratory tests were scheduled to determine the modifications needed in the pulse generator and electrode array to improve field strength. Phase II of Bowers Cruise 48 utilizing modified electrical apparatus was to be conducted during November 1963 in the localities described above.

Note: See Commercial Fisheries Review, December 1963 p. 27.

Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-10 (October 20-November 4, 1963): Catches of brown shrimp were light to moderate during this cruise off the coast of Alabama, Mississippi, Louisiana, and Texas by the chartered vessel Gus III. The vessel (operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries) was engaged in a continuing study of the distribution of shrimp in the Gulf of Mexico.



Shows the station pattern for the shrimp distribution studies in the Gulf of Mexico during Cruise 10 of Gus-III.

Ten statistical areas (10, 11, 13, 14, 16, 17, 18, 19, 20, and 21) were covered. One 3-hour tow with a 45-foot shrimp trawl was made in each of 3 depth ranges (0-10, 10-20, and over 20 fathoms) in those areas.

Moderate catches of brown shrimp were made off Mississippi and Texas, and white shrimp were found in the under 10-fathom depth along the western Gulf coast.

The best single catch consisted of 87 pounds of 15-20 count brown shrimp from the 10-20-fathom range in area 19. That area also yielded 25 pounds of 21-25 count white shrimp from depths below 10 fathoms.

Area 18 produced 14 pounds of 26-30 count white shrimp from the under 10-fathom depth, 17 pounds of 26-30 count brown shrimp from the 10-20-fathom range, and 14 pounds of 15-20 count brown shrimp from over 20 fathoms.

Off southern Texas, area 20 yielded 25 pounds of 26-30 count white shrimp from under 10 fathoms and 22 pounds of 15-20 count brown shrimp from over 20 fathoms. In area 21, a catch of 28 pounds of 21-25 count brown shrimp was made in the 10-20 fathom range.

The catch off Louisiana was generally light, although a tow in under 10 fathoms off Cameron, La., produced 25 pounds of white shrimp, and sampling in the Mississippi Delta area yielded 12 pounds of 21-25 count white shrimp from under 10 fathoms, 17 pounds of 21-25 count brown shrimp from the 10-20-fathom depth, and 20 pounds of 21-25 count brown shrimp from over 20 fathoms.

In area 11 of the Mississippi coast, a catch of 41 pounds of 15-20 count brown shrimp was taken from 10-20 fathoms and 35 pounds of 15-20 count brown shrimp were caught in over 20 fathoms.

In area 10 off Alabama, a tow at the over 20 fathoms station produced 17 pounds of 12-15 count brown shrimp, and trawling in the 10-20-fathom range yielded 6 pounds of 15-20 count pink shrimp. That was the largest catch of pink shrimp taken during the cruise. (The occasional catches of pink srhimp at other stations did not exceed 2 pounds each.)

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.
(2) See Commercial Fisheries Review, Dec. 1963 p. 32.

Hawaii

SKIPJACK TUNA LANDINGS, JANUARY-OCTOBER 1963:

Skipjack tuna landings in Hawaii in October 1963 were about 400,000 pounds, 244,000 pounds below the 1948-62 average for the month. The cumulative total catch for January-October 1963 was 7.8 million pounds, almost 1.6 million pounds below the 1948-62 average for the same period.

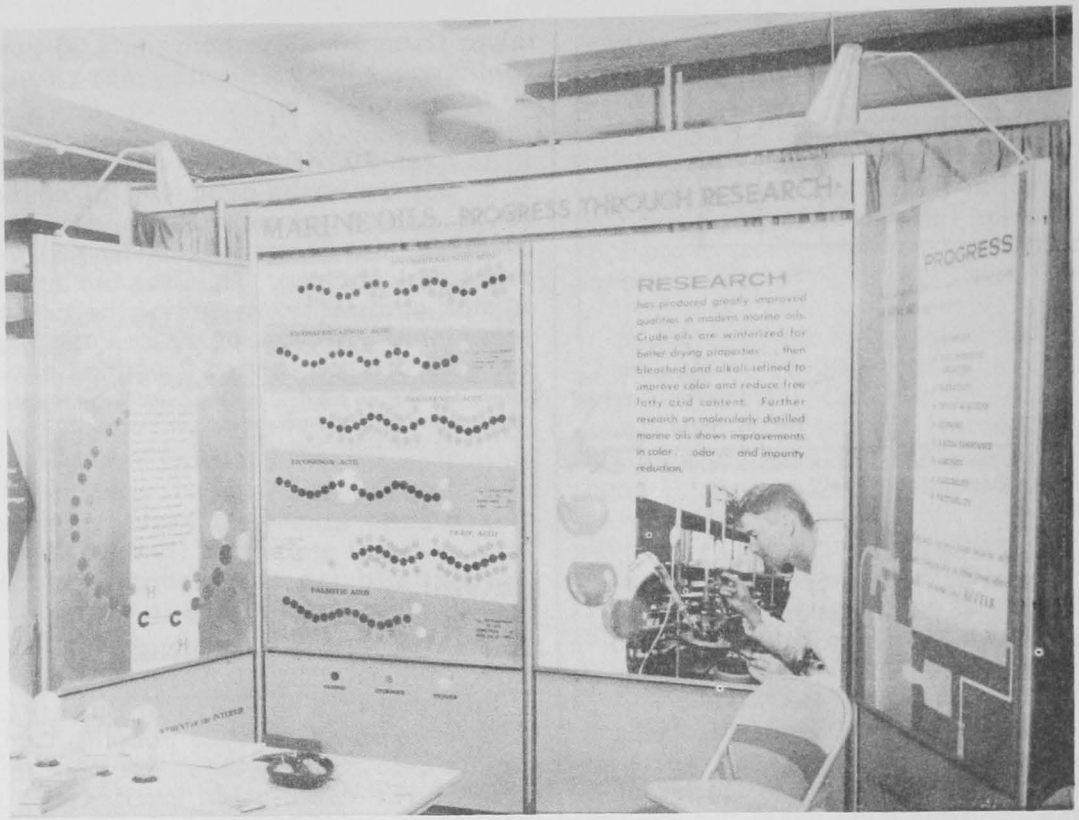
During October there were 89 productive trips, giving an average of 3,074 pounds per productive trip. Individual catches ranged from 114 pounds to 10,165 pounds.

Industrial Fishery Products

NEW USES FOR FISH OILS PROMOTED AT ANNUAL PAINT INDUSTRIES SHOW:

The U. S. Bureau of Commercial Fisheries and the National Fisheries Institute (NFI) jointly sponsored an exhibit and booth at the 28th Annual Paint Industries' Show held in Philadelphia, Pa., October 30-November 2, 1963. The Show was described as an educational exhibit of equipment and materials for decorative and protective coatings manufacturers. To the exhibitor, it offered a unique opportunity to present new materials or new applications of materials and equipment to a carefully selected group of technologists and production personnel of the decorative and protective coatings industry.

The Bureau's exhibit used as its theme "Marine Oils. . . . Progress Through Re-



U. S. Bureau of Commercial Fisheries exhibit and booth at Paint Industries' Show, Philadelphia, Pa. (October 30-November 2, 1963).

search." It was composed of four panels telling of the properties of marine oils, one panel showing a very colorful presentation of the chemical structure of some of the fatty acids found in these oils. Many favorable comments were heard about the exhibit, and numerous questions regarding the chemistry and uses of marine oils were asked by the many visitors who stopped by the booth. Reprints of some publications reporting research conducted on marine oils at the Bureau's Technological Laboratory in Seattle and a fishery leaflet showing some typical uses for marine oils were distributed at the booth.

In addition to the Bureau exhibit, two other exhibitors made direct mention of marine oils, one being a producer of menhaden oil and the other a large user of such oil. The Bureau booth was manned by a member of the Technical Advisory Unit and a research chemist from the Seattle Technological Laboratory.

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U. S. FISH MEAL, OIL, AND SOLUBLES:

Production by Areas, October 1963: Preliminary data on U. S. production of fish meal, oil, and solubles for October 1963 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U. S. Production[1/] of Fish Meal, Oil, and Solubles, October 1963 (Preliminary) with Comparisons

Area	Meal	Oil	Solubles	Homogenized[3/]
	Short Tons	1,000 Pounds	. . (Short Tons) . .	
October 1963:				
East & Gulf Coasts	14,600	12,951	5,669	-
West Coast[2/] .	3,261	1,029	2,090	-
Total	17,861	13,980	7,759	-
Jan.-Oct. 1963 Total	213,244	167,323	86,744	7,216
Jan.-Oct. 1962 Total	275,242	244,009	105,893	8,915

1/Does not include crab meal, shrimp meal, and liver oils.
2/Includes Hawaii, American Samoa, and Puerto Rico.
3/Includes condensed fish.
Note: Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

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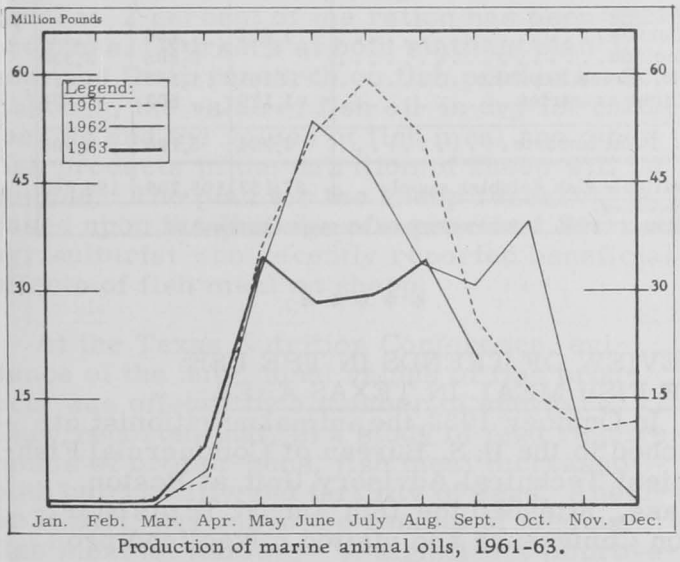
Production, September 1963: During September 1963, 23,247 tons of fish meal and 19.8 million pounds of oil were produced in the United States. Compared with the same month in 1962, this was a decrease of 8,465 tons or

U.S. Production of Fish Meal, Oil, and Solubles, September 1963[1/] with Comparisons

Product	September 1/1963	September 1962	Jan.-Sept. 1/1963	Jan.-Sept. 1962	Total 1962
	(Short Tons)				
Fish Meal and Scrap:					
Herring	1,296	737	6,459	4,548	5,095
Menhaden 2/	18,563	27,285	153,748	198,972	238,680
Sardine, Pacific	7	8	16	673	702
Tuna and mackerel	2,089	1,368	16,058	20,595	26,559
Unclassified	1,292	2,314	17,781	24,802	27,297
Total	23,247	31,712	194,062	249,590	298,333
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	12,899
Grand total meal and scrap	3/	3/	3/	3/	311,232
Fish Solubles:					
Menhaden	8,272	10,091	63,638	71,460	84,885
Other	1,204	2,197	13,296	22,483	28,353
Total	9,476	12,288	76,934	93,943	113,238
Homogenized condensed fish	90	700	7,224	9,570	11,096
	(1,000 Pounds)				
Oil, Body:					
Herring	196	642	4,868	4,759	5,255
Menhaden 2/	18,144	29,611	138,230	192,203	237,815
Sardine, Pacific	2	6	2	164	167
Tuna and mackerel	842	513	3,695	3,841	5,175
Other (including whale)	639	425	6,951	6,918	7,396
Total oil	19,823	31,197	153,746	207,885	255,808

1/Preliminary data.
2/Includes a small quantity of thread herring.
3/Not available on a monthly basis.
Note: Beginning with February 1963, fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.



Production of marine animal oils, 1961-63.

27 percent in meal and scrap production, and approximately 11.4 million pounds or 36 percent less in oil production.

Menhaden meal showed a decrease of 8,722 tons or 32 percent, while menhaden oil (18.1 million pounds) was 39 percent less than in September 1962.

A total of 9,476 tons of fish solubles was manufactured in September 1963--a decrease of 23 percent as compared with the same month in 1962. Production of homogenized condensed fish amounted to 90 tons--a decrease of 610 tons or 87 percent less than in September 1962.

The quantity of fish meal processed during the first 9 months of 1963 amounted to 194,062 tons--55,528 tons less than in the same period

in 1962. Fish solubles and homogenized fish production totaled 84,158 tons--a decrease of 19,355 tons. The January-September production of marine animal oil amounted to 153.7 million pounds--54.1 million pounds less than during the same period of 1962.

* * * * *

Major Indicators for U.S. Supply, October 1963: United States production of fish meal and fish oil in October 1963 was lower by 51.2 and 64.7 percent, respectively, as compared with October 1962. Fish solubles production was down 48.3 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, October 1963

Item and Period	1963	1962	1961	1960	1959
	(Short Tons)				
Fish Meal:					
Production 1/:					
December	-	2,349	12,750	9,185	14,381
November	-	11,023	10,058	8,725	10,797
October	17,861	36,614	16,852	24,455	22,026
Jan.-Sept.	194,062	249,590	257,399	232,583	227,843
Jan.-Dec. prelim. totals 2/	-	288,336	289,039	257,969	275,396
Jan.-Dec. final tot.	-	311,232	311,265	290,137	306,551
Imports:					
December	-	18,977	23,268	15,564	5,538
November	-	11,904	25,649	6,149	3,673
October	-	12,732	9,425	12,515	3,821
Jan.-Sept.	303,810	208,694	159,140	97,333	120,643
Jan.-Dec. totals	-	252,307	217,845	131,561	133,955
Fish Solubles:					
Production 3/:					
December	-	1,613	4,606	3,574	5,039
November	-	4,147	5,153	2,891	5,451
October	7,759	15,010	8,418	11,139	13,946
Jan.-Sept.	84,158	103,513	90,841	88,757	152,477
Jan.-Dec. prelim. totals	-	120,886	109,018	106,361	176,913
Jan.-Dec. final tot.	-	124,334	112,241	98,929	165,359
Imports:					
December	-	387	472	60	420
November	-	435	3,649	282	3,089
October	-	290	110	-	1,908
Jan.-Sept.	2,994	5,196	2,508	2,832	21,213
Jan.-Dec. totals	-	6,308	6,739	3,174	26,630
	(1,000 Pounds) 5/				
Fish Oils:					
Production:					
December	-	605	11,532	8,041	14,457
November	-	7,956	10,539	9,315	8,887
October	13,980	39,563	14,734	23,439	16,866
Jan.-Sept.	153,746	207,885	221,568	163,045	146,611
Jan.-Dec. prelim. totals 4/	-	257,131	259,400	206,848	189,240
Jan.-Dec. final tot.	-	255,808	266,670	215,861	193,324
Exports:					
December	-	172	10,484	15,807	19,586
November	-	171	1,425	14,640	6,096
October	-	26,003	15,202	4,434	14,331
Jan.-Sept.	187,012	96,624	95,373	108,795	104,470
Jan.-Dec. totals	-	123,050	122,486	143,659	144,481

1/Does not include crab meat, shrimp, and misc. meals.
2/Preliminary data computed from monthly data. Fish meal production reported currently comprised 90 percent for 1959, 89 percent for 1960, 93 percent for 1961 and 1962.
3/Includes homogenized fish.
4/Preliminary data computed from monthly data. Represents over 95 percent of the total production.
5/Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.
Note: Data for 1963 are preliminary.

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U.S. FISH MEAL AND SOLUBLES:

Production and Imports, January-September 1963: Based on domestic production and imports, the United States available supply of fish meal for January-September 1963 amounted to 497,872 short tons--39,588 tons (or 8.6 percent) more than during the same period in 1962. Domestic production was 55,528 tons (or 22.2 percent) less, but imports were 95,116 tons (or 45.6 percent) higher than in the same period in 1962. Peru continued to lead other countries with shipments of 231,210 tons.

The United States supply of fish solubles (including homogenized fish) during January-September 1963 amounted to 87,152 tons--a decrease of 21,557 tons as compared with the same period in 1962. Domestic production and imports dropped 18.7 percent and 42.4 percent, respectively.

U. S. Supply of Fish Meal and Solubles, January-September 1963 with Comparisons

Item	Jan.-Sept. 1/1963	Jan.-Sept. 1962	Total 1962
	(Short Tons)		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	153,748	198,972	238,680
Tuna and mackerel	16,058	20,595	26,559
Herring	6,459	4,548	5,095
Other	17,797	25,475	40,898
Total production	194,062	249,590	311,232
Imports:			
Canada	39,535	33,738	42,806
Peru	231,210	156,111	186,249
Chile	22,637	8,255	9,247
So. Africa Republic	7,241	9,584	10,084
Other countries	3,187	1,006	3,921
Total imports	303,810	208,694	252,307
Available fish meal supply	497,872	458,284	563,539
Fish Solubles:			
Domestic production 2/	84,158	103,513	124,334
Imports:			
Canada	1,624	1,196	1,335
Iceland	-	2,205	2,332
So. Africa Republic	191	1,192	1,717
Other countries	1,179	603	924
Total imports	2,994	5,196	6,308
Available fish solubles supply	87,152	108,709	130,642

1/Preliminary.
2/50-percent solids. Includes production of homogenized condensed fish.

* * * * *

REVIEW OF TRENDS IN THE USE OF FISH MEAL IN TEXAS AREA:

In October 1963, the animal nutritionist attached to the U. S. Bureau of Commercial Fisheries' Technical Advisory Unit, at Boston Mass., attended the 18th Annual Texas Nutrition Conference and visited mixed feed pro-

ducers and experiment station scientists in Texas and areas in Arkansas and Louisiana bordering Texas. His observations were as follows:

Levels of fish meal utilization in the area visited vary in two different ways, according to nutritionists formulating rations for production by large firms. First of all there is a regional variation, the levels of utilization being relatively higher in the western part of Texas than in the eastern part of the State and in areas adjoining States located near the Texas border. For example, 5 percent fish meal vs. 2.5 percent in chick starter rations and 2 percent vs. 0.5 percent fish meal in laying rations are typical levels found in rations liberally supplied as compared with others less liberally supplied with the meal. The second variation in rate of utilization is related to the use to which the feed is to be put; relatively low levels of fish meal are found in rations produced for sale under brand names in order to cut costs and enable producers to compete with other manufacturers. However, relatively liberal levels often appear in custom mixed rations because the buyers specify such levels of fish meal.

Workers at the Texas A. and M. Experiment Station are now, and have long been, actively engaged in research on the value of industrial fish products in poultry and livestock feeding. More recently, active research on fish product utilization has been initiated at the substations at Gonzales and Lubbock. At the former station, work on fish product utilization in poultry rations is carried out, whereas at the latter an experiment in which menhaden oil is fed to young cattle at a level equal to 2 percent of the ration has been in progress. Workers at both stations plan to continue their research on fish products. At Lubbock, the value of fish oil in dry lot cattle feeding and the values of fish meal and other fish products in the nutrition of sheep will be studied. The plan for the sheep research is based upon the findings of a practical Scottish agriculturist who recently reported beneficial effects of fish meal on sheep.

At the Texas Nutrition Conference, evidence of the nutritional values of fish products was offered by a number of speakers. They reported that, in a study of feed requirements of broiler hens, fish meal increased both hatchability and fertility of eggs. Another report, described the results of feeding fish meal as follows: "A significant improvement in feed conversion was observed each time the fish meal was substituted in the broiler feed formulas either at the 2.5 or 5 percent levels and in the presence of either 2.5 or 5 percent poultry oil." The speaker postulated that the improvement was due in large part to the presence of unidentified growth factors (UGF) in the meals.

A scientist from Chicago, Ill., stated that unidentified growth factors "are needed in poultry, beef, and swine nutrition, and in many instances can be the deciding factor between success and failure of an enterprise." The speaker presented evidence that UGF protects swine from gastric ulcers. In addition, he reported that feed efficiency of broilers during a 9-week period was greater on rations containing 3 percent fish meal than on similar rations containing 1 percent fermentation product.

Speakers from the Texas A. and M. University, presented results of an experiment that showed fish meal to be a necessary ingredient of an economical ration for swine. Ordinary (not degossypolized) cottonseed meal was fed swine with and without iron salts and with and without fish meal. A ration containing 7 percent fish meal with iron salts resulted in the highest rate of gain and greatest feed efficiency when comparisons were made with rations (1) lacking fish meal, (2) containing 4.3 percent fish meal, and (3) containing meat scraps as a substitute for fish meal. This finding is of commercial importance in the southern states where cottonseed meal is the least expensive protein concentrate available. However, untreated cottonseed meal contains gossypol which is toxic to swine, and for this reason cottonseed meal ordinarily has not been used in mixed feeds for swine. The Texas finding paves the way for the production of economical rations for swine in the southern states using cottonseed meal as an economical source of protein together with an iron salt and fish meal--the latter is an essential part of the ration. (Technical Advisory Unit, Boston, Mass., November 7, 1963.)

Irradiation Preservation

COMPARATIVE TESTS MADE WITH IRRADIATED FILLETS AND FRESH CONTROLS: As part of the research on the irradiation of seafoods under way at the Gloucester Tech-

nological Laboratory of the U. S. Bureau of Commercial Fisheries, large scale acceptability tests were conducted in November 1963 at Fort Lee, Va. Chemists from the Bureau's Laboratory supervised the preparation of samples of irradiated haddock fillets for use in the tests with troops at Fort Lee.

The irradiated haddock fillets were fed to 300 soldiers, and an equal number were served fresh controls. Following the tests the soldiers completed score sheets to indicate their preferences. The results were to be analyzed statistically and evaluated to determine overall preference.

Maine Sardines

CANNED STOCKS, NOVEMBER 1, 1963:

Canners' stocks of Maine sardines on Nov. 1, 1963, were 93,000 cases less than the 1,348,000 cases on hand Nov. 1, 1962, but were 1,034,000 cases above stocks on hand two years ago on Nov. 1, 1961 (the pack for the 1961 season was unusually small). Distributors' stocks of 308,000 cases of canned Maine sardines were up 34.0 percent from the 230,000 cases on hand Nov. 1, 1962, and up 52.5 percent from the 202,000 cases on hand Nov. 1, 1961.

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, November 1, 1963, with Comparisons

Type	Unit	11/1/63	11/1/62	11/1/61
Distributors . .	actual cases	308,000	230,000	202,000
Canners	std. cases 1/	1,255,000	1,348,000	221,000

1/100 3¾-oz. cans equal one standard case.
Source: U. S. Bureau of the Census, "Estimates of Distributors' and Canners' Stocks--Nov. 1, 1963."

The 1963 season pack totaled about 1,500,000 standard cases on Nov. 1, 1963, when the pack was virtually complete, according to the Maine Sardine Council. On April 15, 1963, carryover stocks at the canners' level amounted to about 660,000 cases. Adding the pack as of Nov. 1, 1963, results in a total supply of 2,160,000 cases as of that date--up 2.6 percent from the total supply of 2,106,100 cases reported Nov. 1, 1962, and higher by 98.7 percent from the short supply of 1,087,000 cases as of Nov. 1, 1961.

Table 2 - Canned Maine Sardines--Season Supply as of November 1, 1963, with Comparisons

Item	1963	1962	1961
	. . . . . (Std. Cases 1/)		
Canners' carryover stocks on April 15 2/	660,000	33,000	457,000
Season pack to Nov. 1 2/ . .	1,500,000	2,073,100	630,000
Total supply as of Nov. 1 .	2,160,000	2,106,100	1,087,000

1/100 3¾-oz. cans equal one standard case.
2/The usual legal packing season in Maine, extending from April 15 to Dec. 1, was in effect during the 1961 and 1963 season. The 1962 season was extended to 13 months--Dec. 2, 1961-Jan. 1, 1963--but the 1962 pack canned before April 15 was insignificant.

Note: Beginning with the Canned Food Report of April 1, 1963, U. S. Bureau of the Census estimates of distributors' stocks were based on a revised sample of merchant wholesalers and warehouses of retail multiunit organizations. The revised sample resulted in better coverage. The January 1, 1963, survey was conducted with both samples to provide an approximate measure of the difference in the two samples. That survey showed that the estimate of distributors' stocks of canned Maine sardines from the revised sample was 13 percent above that given by the old samples.
Source: U. S. Bureau of the Census, Canned Food Report, Nov. 1, 1963.

Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, WINTER 1963/64:

It is expected that total United States catch of fishery products during 1963 will be somewhat lower than a year earlier. During the first 8 months in 1963, total landings were down about 13 percent from a year earlier. However, cold-storage holdings of edible fishery products on October 1, 1963, were 224 million pounds, about 17 million larger than on the same date in 1962. The last few months of 1963 is a season of normal decline for landings of fish and shellfish.

Imports of edible fish through August 1963 were down about 6 percent from a year earlier. There was a 2.2 percent decrease in value of imports. Sharp decreases occurred in imports of canned tuna in brine, canned salmon, canned sardines in oil, and frozen tuna. Increases occurred in canned sardines not in oil, frozen shrimp, ocean perch fillets, fresh swordfish, and canned crab meat. Continued decrease in total imports was expected for the remainder of 1963.

Wholesale fish prices in September 1963 were almost 11 percent lower than a year earlier. Retail prices were down only slightly. But there were sharp decreases in prices for fresh and frozen shrimp and for most canned fish products. During the latter part of 1963, prices were expected to remain about stable.

Per capita consumption during the winter months of 1963/64 probably will be down from a year earlier.

This analysis was prepared by the Bureau of Commercial Fisheries, Fish and Wildlife Service, U. S. Department of the Interior, and published in the Department of Agriculture's November 1963 issue of The National Food Situation (NFS-106).

Michigan

LAKE TROUT STOCKING PROGRAM CONTINUED IN FALL 1963:

Plantings of about 300,000 lake trout were made in 15 northern Michigan lakes by the Michigan Conservation Department in the fall of 1963.

The plantings, made up of about 260,000 fingerlings and 40,000 keeper-sized fish, were carried out as part of a continuous program to maintain lake trout numbers in inland waters where there is virtually no natural reproduction by these fish.

The releases of fingerlings totaled 100,000 in Lake Michigamme; 10,000 in Little Oxbow Lake; 50,000 each in Golden and Smokey Lakes; and 50,000 in Walloon Lake.

Plantings of legal-sized lake trout included 5,000 in Glen Lake; 1,245 in Grand Sable Lake; 100 and 1,000 in Tilden and Squaw Lakes; 2,500 in Lake Bellaire; 3,000 each in Chicagon and Golden Lakes; 10,000 and 5,000 in Elk and Torch Lakes; and 9,300 in Higgins Lake.

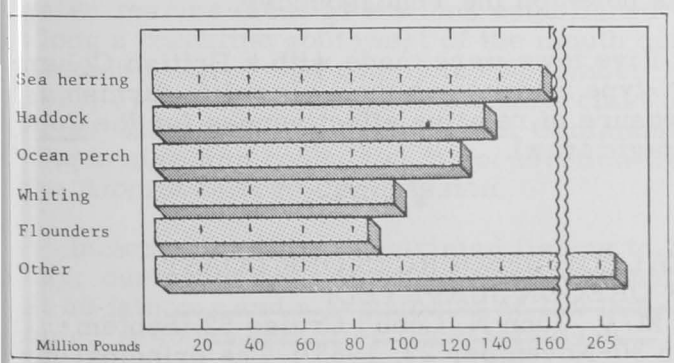
Another 55,775 legal and sublegal lake trout were released in the spring of 1963 in Crystal Lake, Walloon Lake, Golden and Chicagon Lakes, Tilden and Squaw Lakes, and Lake Avalon.

New England

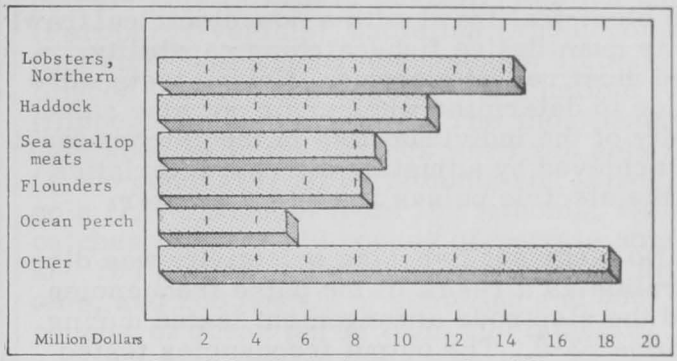
FISHERIES, 1962:

Fish and shellfish landings in the New England States (Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut) during 1962 amounted to 872 million pounds valued at $66 million ex-vessel. Compared with 1961, this was an increase of 112 million pounds (15 percent) and $5 million (8 percent).

The gain in production resulted chiefly from sea herring landings of 158 million pounds--up 100 million over 1961. There was a considerable increase in the catch of yellowtail flounders. Landings of cod, whiting, and lobsters also showed improvement compared with 1961. These increases, however, were partially offset by reduced landings of ocean perch, pollock, and sea scallops.



New England states catch, 1962.



Value of New England states catch, 1962.

The 1962 Maine landings of 294 million pounds and Massachusetts landings of 493 million increased about 96 million pounds and 23 million pounds, respectively, compared with 1961. Rhode Island production in 1962 totaled nearly 77 million pounds--a decline of 7 million. Landings in New Hampshire (1 million pounds) and Connecticut (6 million pounds) remained much the same as in 1961.

There were 21,549 fishermen engaged in the New England fisheries in 1962--about 188 less than in 1961. This decrease occurred in the vessel fishery and in the number of regular fishermen employed in the shore and boat fisheries. The latter fishery showed an increase of 265 casual fishermen compared with 1961. Fishing craft operated in the New England area during the year consisted of 729 vessels totaling 45,839 gross tons, 10,414 motor boats, and 699 other boats.

North Atlantic Fisheries Exploration and Gear Research

ELECTRICAL TRAWLING TESTS CONTINUED:

M/V "Delaware" Cruise 63-9 (September 28-October 10, 1963 and October 15-24, 1963): To continue to test and evaluate the effect of an electric field upon the catch of a commercial otter-trawl net when the field is used as an adjunct to the net, was the main purpose of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. The electrical system was designed primarily to immobilize fish in the path of the advancing trawl. The equipment

used was similar to that tested during Delaware Cruise 62-9 (July 11-August 24, 1962).

The earlier trials were made to compare the electrical trawl with a non-electrical trawl as to quantitative fish-catching capability. The most recent electrical fishing tests were made to determine whether or not size selectivity of the individual fish in the catches could be achieved by adjusting the characteristics of the electric pulses fed into the water.

No clear cut fish-size selectivity was discernible as a result of the pulse frequencies and the electrode arrangement tested during Cruise 63-9. The output frequencies tested were 10 and 40 pulses per second from two net transformers which were fired alternately. (A single anode and cathode were connected to each transformer secondary.) The similarity of results from fishing with those frequencies indicate the possibility of an overlapping of the effective fields. If that was the case, the number of pulses per second in the overlapped field space would have been doubled. This could have obscured the possible effect of the lower pulse frequency. A modification of the equipment to provide a pure pulse frequency throughout the field is planned for the next scheduled electro-trawling trials in February 1964.

The conductor towing warps used during the cruise were comprised of an insulated single conductor made of copper (located at the center of the cable) with two outer, non-insulated, layers of stranded steel wire for strength. The steel wire was successfully used as the electrical return from the net transformers. This wire, however, was subject to bruising, and easy rupture of the conductor insulation was the result. A more mechanically suitable system, such as an adequately designed third wire and winch, may utimately be required.

Fishing was conducted with a No. 41 large mesh ($4\frac{1}{2}$-inch internal measurement), manila net. After the first few days of fishing the large mesh cod end was replaced with a $2\frac{1}{2}$-inch cod end for the collection of smaller fish. No consistent differences were found between the size selectivity of 10 and 40 pulses per second when taking either large or small fish.

Note: See Commercial Fisheries Review, November 1962 p. 31.

North Pacific Exploratory Fishery Program

PELAGIC TRAWL TESTED FOR EFFECTIVENESS IN CATCHING WINTER HERRING:

M/V "Yaquina" Cruise 1 (November 6-24, 1963): The primary objectives of this cruise by the U. S. Bureau of Commercial Fisheries chartered exploratory fishing vessel Yaquina were to: (1) evaluate the catching effectiveness of a modified Cobb pelagic trawl in capturing winter herring; (2) determine net efficiency and behavior characteristics relative to the capture of winter herring; and (3) evaluate the utility of the chartered vessel Yaquina for fishing gear research. Tests and trials were conducted in the San Juan Islands, Strait of Georgia, and Bellingham Bay areas of Puget Sound.

Extensive soundings were made throughout the cruise area, but concentrations of herring were found only in the Bellingham Bay-Eliza Island area. Several 1-hour hauls in that area yielded herring in excess of 2,000 pounds. But no catches exceeded 3,000 pounds, although commercial seine fishermen in the immediate vicinity captured quantities up to 40 tons or more a set.

A total of 600 pounds of large herring were collected for radiation studies.

Underwater observations by SCUBA-equipped divers pointed up the need for additional net modifications. Small-mesh liners were installed in the intermediate and cod-end sections, and a small-mesh fyke was installed in the forward section of the cod end. The modifications resulted in only slight improvement in the catches.

Through the courtesy of a fish company in Seattle, Wash., the M/V Paragon assisted in a single attempt to tow the Cobb pelagic trawl with two vessels. A one-ton herring catch was made even though little indication of fish was noted on the echo-sounder.

Five tows were made with a British Columbia-type midwater herring trawl to furnish a measure of relative effectiveness for the Cobb pelagic trawl.

* * * * *

SCALLOP RESOURCES OFF COAST OF OREGON SURVEYED:

M/V "John N. Cobb" Cruise 62 (September 30-November 22, 1963): The principal ob-

jective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb was to locate and delineate the scallop resources along the Oregon coast.

The regions surveyed during this cruise were the areas from Cape Arago to Newport, Oreg., and from the Columbia River lightship to Cape Falcon, Oreg.

A total of 126 drags were made in water depths ranging from 30 to 70 fathoms. The best catches in the area from Cape Arago to Newport occurred off the Siuslaw River in depths of 45 to 55 fathoms. These catches ranged up to 175 scallops ($1\frac{1}{2}$ bushels) per one-half hour drag. The eastern otter trawl was also fished and the resultant catches were not as large. The incidental trawl fish catch was quite large and therefore the use of this gear was less desirable. In the area from the Columbia River to Cape Falcon the best catches occurred off Tillamook Head in 50 to 55 fathoms of water. The catches ranged up to 635 scallops (4 bushels) per half-hour tow. Night and day comparison drags were made with no difference in the scallop catches.

Due to the extreme weather conditions encountered, the area from Newport, Oreg., to Cape Falcon could not be surveyed as was planned.

Approximately 400 pounds of fresh scallops were delivered to the Oregon State University Seafood Laboratory at Astoria, Oreg., for a meat yield study.

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SURVEY OF DEEP-WATER MARINE FAUNA OFF MOUTH OF COLUMBIA RIVER CONTINUED:

M/V "Commando" Cruise 12: The 12th in a series of cruises designed to monitor deep-water marine fauna at stations established along a trackline southwest of the mouth of the Columbia River was completed November 14, 1963, by the U. S. Bureau of Commercial Fisheries chartered research vessel Commando. The cruise was conducted in cooperation with the Atomic Energy Commission.

Inclement weather restricted fishing to 1 day, during which a 30-minute tow was made at 50 fathoms and a 1-hour tow at 100 fathoms. A 400-mesh otter trawl was used.

Commercial species of fish taken during trawling included Dover sole (Microstomus pacificus), rex sole (Glyptocephalus zachirus), petrale sole (Eopsetta jordani), English sole (Parophrys vetulus), sablefish (Anoplopoma fimbria), ocean perch (Sebastodes alutus), lingcod (Ophiodon elongatus), and halibut (Hippoglossus stenolepis). The most abundant species in the catches were rex sole (1,200 pounds) from 50 fathoms and Dover sole (1,500 pounds) from 100 fathoms. Other catches included 50 pounds of petrale sole and 150 pounds of English sole from 50 fathoms, and 200 pounds of sablefish and 400 pounds of ocean perch from 100 fathoms.

Small quantities of Dungeness crab (Cancer magister) and pink shrimp (Pandalus jordani) were found.

Samples of fish were collected and delivered to the Laboratory of Radiation Biology, Universtiy of Washington, for radiological analysis.

The cooperative program with the Oregon Fish Commission to study the migrations of Dover sole and sablefish was continued with the tagging of 99 Dover sole and 13 sablefish.
Note: See Commercial Fisheries Review, November 1963 p. 40.

Oceanography

ADDRESS TO THE NATIONAL ACADEMY OF SCIENCES BY THE LATE PRESIDENT KENNEDY:

The late President Kennedy on October 22, 1963, addressed the centennial convocation of the National Academy of Sciences, held in Washington, D. C. The following excerpts from his speech are of particular interest to oceanographers:

"I recently sent to Congress a plan for a national attack on the oceans of the world, calling for the expenditure of more than $2 billion over the next ten years. This plan is the culmination of three years' effort by the Inter-Agency Committee on Oceanography, and it results from recommendations made by the National Academy.

"Our goal is to investigate the world ocean, its boundaries, its properties, its processes. To a surprising extent, the sea has remained a mystery. Ten thousand fleets still sweep

The late President John F. Kennedy.

over it in vain. We know less of the oceans at our feet, where we came from, than we do of the sky above our heads. It is time to change this, to use to the full our powerful new instruments of oceanic exploration, to drive back the frontiers of the unknown in the waters which encircle our globe.

"I can imagine no field among all those which are so exciting today than this great effort which our country and others will carry on in the years to come. We need this knowledge for its own sake. We want to know what is under the sea, and we need it to consider its bearings on our security, and on the world's social and economic needs. It has been estimated, for example, that the yield of food from the seas could be increased five or ten times through better knowledge of marine biology, and some day we will seed and weed and harvest the ocean. Here, again, the job can best be done by the nations of the world working together in international institutions.

"As all men breathe the same air, so a storm along Cape Cod may well begin off the shores of Japan. The world ocean is also indivisible, and events in one part of the great sea have astonishing effects in remote places.

"International scientific cooperation is indispensable if human knowledge of the ocean is to keep pace with human needs. . . .

"If science is to press ahead in the four fields (natural resources, oceanography, meteorology, environmental controls) that I have mentioned, if it is to continue to grow in effectiveness and productivity, our society must provide scientific inquiry the necessary means of sustenance. We must, in short, support it. Military and space needs, for example, offer little justification for much work in what Joseph Henry called abstract science. Though such fundamental inquiry is essential to the future technological vitality of industry and Government alike, it is usually more difficult to comprehend than applied activity, and, as a consequence, often seems harder to justify to the Congress, to the Executive Branch, and to the people. . . .

"Science has made all of our lives so much easier and happier in the last 30 years. I hope that the people of the United States will continue to sustain all of you in your work and make it possible for us to encourage other gifted young men and women to move into these high fields which require so much from them and which has so much to give to all of our people. So the need is very great. Even though some of your experiments may not bring fruition right away, I hope that they will be carried out immediately.

"It reminds us of what the great French Marshal Lyautey once said to his gardener: 'Plant a tree tomorrow.' And the gardener said, 'It won't bear fruit for a hundred years.' 'In that case,' Lyautey said to the gardener, 'plant it this afternoon.' That is how I feel about your work."

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COMMITTEE FOR SCIENTIFIC EXPLORATION OF THE ATLANTIC SHELF:

The Committee for the Scientific Exploration of the Atlantic Shelf (SEAS) held its winter meeting on December 12-13, 1963, in Washington, D. C. The SEAS Committee membership is comprised of marine biologists, physical and chemical oceanographers, geological oceanographers, and marine meterologists who are conducting research operations on the Atlantic shelf environment.

The role of the SEAS Committee has been outlined as follows: (1) To emphasize the importance of the Atlantic shelf and stimulate interest in its oceanography; (2) to intensify observations of the shelf environment--physical, chemical, geological, and biological; (3) to provide the nucleus for the development of integrated large-scale marine research efforts; (4) to foster systems for continuous collection and compilation of environmental data; (5) to foster efficient means for the exchange of data currently collected by all laboratories; (6) to provide a sounding board for

development of new equipment and techniques; and (7) to provide an opportunity for regular exchange of ideas and for growth of community opinion on environmental research. (National Oceanographic Data Center, Newsletter, October 31, 1963.)

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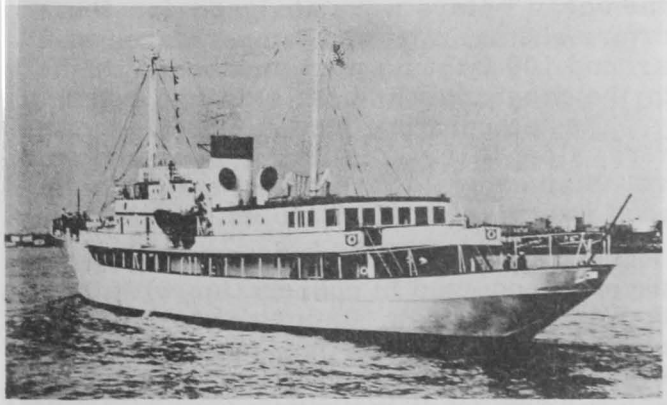
HONOLULU LABORATORY VESSEL FINISHES FIRST PHASE OF INDIAN OCEAN SURVEY: M/V "Anton Bruun" Cruise 2 (May 22-July 23, 1963): Halfway around the world from their home base, the Biological Laboratory at Honolulu, scientists, and fishermen of the U. S. Bureau of Commercial Fisheries have been engaged in a study of the high-seas fishery resources and oceanography of the Indian Ocean. According to the Bureau's Hawaii Area Director, this far-flung research project is part of a larger effort in which the marine scientists of many countries have joined forces in a concerted study of the waters, the living inhabitants, the weather, and the submarine geology of the least-known of the world's oceans. The Honolulu Laboratory was selected to carry out the United States' fishery research portion of this program because of the extensive experience which its staff has accumulated in the investigation of tunas and other open-sea fishes and their environments in the tropical Pacific. From what was known of the Indian Ocean, it was expected that the tunas and spearfishes would also figure prominently in the fishery picture there.

The first tuna fishing cruise under the program was Cruise 2 of the research vessel Anton Bruun. This vessel (formerly the Presidential yacht Williamsburg) is being used as a floating laboratory for the United States biological studies in the Indian Ocean. Although the Anton Bruun is much larger than most tuna fishing boats, and was not designed for such utilitarian employment, a fishery research biologist at the Honolulu Laboratory, and Chief Scientist of Cruise 2, managed to work out modifications that made it possible to fish successfully with tuna long lines from the ship.



Research vessel Anton Bruun (formerly the Presidental yacht Williamsburg).

This cruise began May 22, 1963, at Bombay, India, and was completed with the vessel's return to that port on July 23. This period was chosen for sampling fish distribution and environmental conditions during the southwest monsoon, when the prevailing wind is from the southwest, one of the two sharply contrasting seasons of the Indian Ocean area. The Indian Ocean is the only major body of water in the world which is under the influence of two "trade wind" systems from one season to the next. This fact makes environmental studies of this kind very important. Studies of this type could greatly increase our understanding of the effect of a changing environment on oceanic food resources. Two scientists and five Honolulu fishermen carried out sampling of the fish populations at 33 locations on two lines running north and south across the Equator at 70 and 80 degrees E. long., south of the tip of the Indian peninsula. At each location, 240 baited hooks were set 200 to 300 feet below the surface of the sea. This fishing was paralleled by measurement of sea temperatures and sampling of the ocean water at depths down to 6,000 feet and collection of various small living forms associated with the larger fishes of the surface layers.

The main components of the catches were yellowfin and albacore tuna, along with bigeye tuna, marlin and sailfish, and sharks of a number of species. The best tuna catch of the cruise was made slightly north of the Equator in the vicinity of the Maldive Islands, where 44 yellowfin were taken in one day, for an unusually high catch rate of 18.4 fish per 100 hooks.

Distribution of the long-line catches, when compared with distribution of the ocean water types encountered on the cruise, showed that albacore were caught only in the South Indian Ocean Central type of water, while the other tunas--yellowfin, bigeye, and skipjack-- were taken throughout this water type as well as in the Equatorial water type and along the southern edge of the Arabian Sea water. The marlins were associated in general with the Arabian Sea and Equatorial waters, while the great

blue shark, like the albacore, was found only in the South Indian Ocean Central water.

Plans have been made at the Laboratory for the second long-line fishing cruise of the Anton Bruun, to sample conditions during the northeast monsoon season, from January through March 1964. This cruise will provide important material for comparing seasonal changes in the abundance of the large, open-sea fishes and in the distribution of the water types in which they live.

Data on the catches of the Anton Bruun and of the Japanese commercial tuna vessels fishing in the Indian Ocean will be combined with the oceanographic data collected by all ships participating in the International Indian Ocean Expedition in a joint study by scientists from the Honolulu Laboratory and the Nankai Regional Fisheries Research Laboratory, Kochi, Japan. This study should lead to an understanding of the relationship between the distribution and abundance of the tunas and billfishes and the ocean current systems of the Indian Ocean. (U.S. Bureau of Commercial Fisheries, Biological Laboratory at Honolulu, Scientific News Notes, October 1963.)

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INDIAN OCEAN EXPLORATIONS BY THE "ATLANTIS II" COMPLETED:

The Woods Hole Oceanographic Institution research vessel Atlantis II was one of the major United States vessels participating in the wide-ranging International Indian Ocean Expedition, involving some 25 countries and 44 vessels. The Atlantis II, which left its home port in July 1963, completed its observations in November and returned to Woods Hole, Mass., late in December 1963. Although a wide variety of observations were made during the cruise, the main task of the Atlantis II was to obtain data on the physical movements of the water in the western half of the Indian Ocean.

The chief scientist on the Atlantis II during the cruise said, "It's far too early to generalize on our findings, but we have learned that it is a very complex ocean, and we did accomplish what we set out to do. . .to get a comprehensive view of the Indian Ocean during one of the monsoon seasons."

The important Somali Current, which sweeps up the eastern coast of Africa at a speed in excess of four knots, was revealed to be considerably wider and deeper than previously supposed. The Atlantis II scientists measured it to be some 150 miles wide and 1,000 meters deep, with the total water transport about one-fifth that of the great Gulf Stream off the east coast of the United States.

The area of the Somali Current also has a considerable upwelling of colder water and nutrients from the bottom. In air temperatures of 32.2° C. (90° F.), surface temperatures of the stream were recorded at around 15.6° C. (60° F.). They might be expected to be about 27° C. (80.6° F.) without the influence of the stream. Just to the east of the Somali Current, there appears to be a more shallow counter current running southward; with another northward current just to the east of it.

Another interesting feature of the cruise of the Atlantis II was the relatively slight rainfall encountered. July to September is the traditional rainy season on the continent of India with the prevailing winds sweeping generally to the northeast from the ocean. At sea, however, the rainfall was quite slight during the entire cruise.

As could be expected, the data collected raised many questions. For instance, why is the Arabian Sea so rich in nutrients? What causes the complex water movements observed? What is the reason for the double oxygen minimum layer found all over the area? And does the relatively less saline water found in certain places imply a closed circulatory system involving both meteorological and oceanographic phenomena?

Techniques applied in the collection of data included the use of drift bottles for surface current measurements, as well as other devices that were tracked near the bottom and at middle depths. The important upper layers of the ocean waters were analyzed for temperature and salinity, and temperatures down to around 100 fathoms were measured by the bathythermograph while the ship was underway. The temperature structure of deeper waters, along with water samples for analysis, were obtained by lowering Nansen bottles at spaced intervals on steel cables.

A program of meteorological investigations was conducted in cooperation with the U.S. Weather Bureau. Radio-sonde observations were made daily. Also, the phenomena of evaporation, precipitation, solar radiation, humidity, and other meteorological factors were measured aboard ship.

In addition, technicians conducted a program of continuous echo-sounding to chart the bottom configuration of the areas covered. Some biological data were obtained to study the effects of the monsoon winds on the productivity of the waters. Other investigations involved an experimental radio navigation system, computations of the wave power spectra, rain water chemistry, and measurements of magnetic fields.

Starting from Bombay, India, the Atlantis II criss-crossed the western half of the Indian Ocean working its way south. Its major ports of call were Colombo, Ceylon; Zanzibar, Tanganyika; Seychelles Islands; Diego Suarez, Madagascar; Port Luis, Mauritius and Lourenco Marques, Mozambique.

The Atlantis II is scheduled to return to the Indian Ocean in 1965 for additional observations. Other Woods Hole Oceanographic Institution participation in the International Indian Ocean Expedition includes meteorological observations by scientists from a four-engine aircraft, and a cruise to the area early in 1964 by the research vessel Chain, principally for geophysical studies.

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NEW RESEARCH VESSEL TO BE ACQUIRED BY DUKE UNIVERSITY:

The National Science Foundation has provided funds for a new research vessel for the Duke University Marine Laboratory, Beaufort, N. C., according to reports. The vessel should be delivered in the summer of 1964. Its first cruise is tentatively scheduled for July 30, 1964. It will accommodate 15 to 26 scientists as well as up to 15 crewmen. Its over-all length will be 117½-feet, with an average displacement of 474 tons and a range of 4,500 to 5,000 nautical miles.

The new vessel should contribute to improved observational coverage and over-all knowledge of the continental shelf between Chesapeake Bay and the area off Georgia. (National Oceanographic Data Center, Newsletter, October 31, 1963.)

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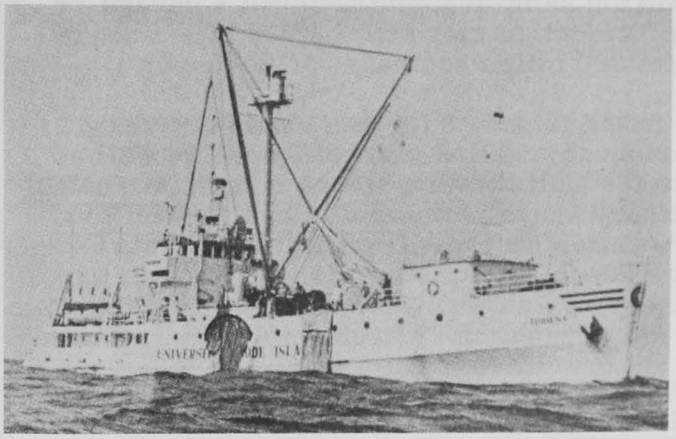
RESEARCH VESSEL "TRIDENT" COMPLETES FIRST YEAR OF OPERATION:

During its first year of operation, the University of Rhode Island (URI) research vessel Trident logged more than 30,000 miles, completed 11 scientific cruises, and spent 201 days at sea. The 180-foot, vessel carried 53 members of the URI Graduate School of Oceanography, as well as faculty members from other Universities, on expeditions ranging from Block Island Sound off Rhode Island to the West Coast of Africa.



University of Rhode Island research vessel Trident.

"Operation DEBUT," the University's first cruise with the Trident, began September 15, 1962, in California, when a group of scientists and the crew took over the former Army maintenance and supply vessel, which was built in 1944 at a cost of $1.2 million. (The U. S. Office of Naval Research spent an additional $300,000 in converting the vessel.)

In the maiden cruise down the Coast of Central America through the Panama Canal and on to Providence, R. I., via Bermuda, scientists initiated open ocean bacteriological studies and began investigations of the form, structure, and organic functions of certain seaweed. In November 1962, the Trident was used for geological work in Block Island Sound. In mid-January 1963, a cruise was cut short because of mechanical problems.

On March 22, 1963, the vessel put to sea for its longest cruise. Ports of call included Bermuda; Monrovia, Liberia; and Sierra Leone. Operating off the west coast of Africa; bottom cores were taken, bottom sediments were sampled, the floor of the ocean was photographed, and numerous other projects were completed before returning to Narragansett Bay nearly three months later. One other cruise by the research vessel was conducted in June, plus 2 more in July, and 2 in August. In September, she cruised through the Sargasso Sea. At the beginning of October 1963, a scientific party equipped with an electronic

plankton sampling device began a voyage on the Trident of more than 2,000 miles to a point 300 miles southeast of Bermuda.

In the future, trips are planned to the Caribbean and the coast of Spain, as well as into the Gulf Stream, where it is hoped new techniques can be used to measure the flow of water. (National Oceanographic Data Center, Newsletter, October 31, 1963.)

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SEA BOTTOM OF THE CARIBBEAN AREA UNDER STUDY:

Geophysical events of the past 50 million years in the Caribbean Sea area were undergoing intensive study in late 1963 by scientists of the Woods Hold Oceanographic Institution aboard the 218-foot research vessel Chain.

From earlier land-based studies made on the island of Hispaniola, which includes Haiti and the Dominican Republic, it was determined that adjacent parts of the earth's crust in that area have behaved differently during this vast stretch of time. The crust under the eastern third of the Dominican Republic and eastward to Puerto Rico has remained relatively stable during this time. To the west, however, strong faulting and crustal warping was active and appears to be continuing today.

The chief scientist on the Chain cruise said that the objective of the present investigations is to determine the extent of these two areas of diverse crustal behavior by extending the previous landbased observations to a study of the crust under the sea.

The scientists used a variety of oceanographic instruments for the study. One key part of the investigation was the continuous measurement of the earth's gravity in the area, which varies to a minute but detectable degree depending on the thickness of the crust and its composition. To perform this job, a new shipboard data processing system was employed that automatically samples, computes, and records information on the ship's navigation, the depths of the ocean, and the gravity and magnetic fields of the earth.

The shape of the sea floor was studied by recording and measuring echo reflections from sounding equipment on shipboard. Bottom photography was employed as a means of obtaining a better idea of the sea floor composition by visual observation of undisturbed conditions. Another technique to be used was a number of measurements of the flow of heat into the ocean from the earth, which is another indication of crustal activity.

The cruise, which was sponsored by the U. S. Navy's Office of Naval Research, was expected to last about six weeks. (Woods Hole Oceanographic Institution, December 2, 1963.)

Pollution

POTOMAC RIVER FISH LOSSES:

The Interstate Commission on the Potomac River Basin (ICPRB) reported that a technical conference by 13 agencies of Maryland and Virginia and the ICPRB had reached the tentative conclusion that the massive fish kill in the lower Potomac River and the Chesapeake Bay in mid-1963 was probably caused by a disease peculiar to white perch, the fish most affected by the kill. Vigorous study of possible bacterial and viral causes was recommended. (Sport Fishing Institute, Bulletin, November 1963.)

Note: See Commercial Fisheries Review, September 1963 p. 43.

Shellfish

LAKE ERIE SHELLFISH MAY HAVE COMMERCIAL VALUE:

Studies by biologists of the U. S. Bureau of Commercial Fisheries in Sandusky Bay, Lake Erie, have revealed the presence of substantial numbers of the Japanese snail and fresh-water mussels. The large live-bearing snails are highly prized by aquarists. Whether there is sufficient demand to warrant a small fishery is yet to be determined.

In addition to the Japanese snail, at least 12 species of fresh-water mussels were collected in Sandusky Bay. Efforts are under way to determine their abundance and suitability for use in making core pellets for the culture pearl industry. There is an excellent demand for fresh-water mussel shells for the Japanese pearl industry. As a result of the decline in Tennessee River fresh-water mussel shell production, buyers are seeking other sources of supply in the United States for the several thousand tons of shells needed each year.

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Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, NOVEMBER 1963:

Item and Period	1963	1962	1961	1960	1959
	(1,000 Lbs., Heads-Off)				
Total landings, So. Atl. and Gulf States:					
December	-	8,615	6,538	7,099	8,716
November	13,200	11,604	9,996	14,454	12,412
October	21,872	14,699	12,696	21,688	19,601
September	18,195	13,182	9,691	18,832	18,330
January-August	75,188	57,739	52,474	78,961	71,600
January-December	-	105,839	91,396	141,035	130,660
Quantity canned, Gulf States 1/:					
December	-	1,879	816	894	1,173
November	2,400	2,727	2,175	1,535	2,122
October	4,180	4,454	2,065	2,480	2,324
September	3,640	1,727	598	2,222	1,936
January-August	16,961	12,423	8,846	19,263	15,104
January-December	-	23,210	14,500	26,394	22,659
Frozen inventories (as of end of each mo.) 2/:					
December 31	-	31,577	19,755	40,913	37,866
November 30	3/	27,500	20,668	37,264	37,334
October 31	4/ 37,418	21,315	17,811	31,209	33,057
September 30	4/ 27,356	12,843	13,361	24,492	26,119
August 31	4/ 24,803	12,754	12,728	20,171	23,780
July 31	4/ 25,460	13,677	14,849	17,397	22,352
June 30	4/ 24,047	13,796	19,416	15,338	19,283
Imports 5/:					
December	-	15,798	15,442	12,411	10,611
November	-	17,964	14,852	13,516	10,269
October	-	18,279	16,813	14,211	15,340
September	10,236	9,696	8,629	8,190	7,541
January-August	90,085	79,446	70,546	65,091	62,794
January-December	-	141,183	126,268	113,418	106,555
	(¢/lb., 26-30 Count, Heads-Off)				
Ex-vessel price, all species, So. Atl. & Gulf Ports:					
December	-	82.9	75.2	54.2	48.4
November	6/ 52-65	84.5	73.5	54.0	46.2
October	6/ 52-62	90.0	68.7	53.0	44.4
September	6/ 55-61	90.9	70.1	52.2	46.4
August	6/ 57-71	83.6	66.1	52.0	46.9
July	63.5	82.1	55.8	54.6	49.2
June	77.0	84.4	53.7	64.1	60.7
May	80.9	83.7	52.8	62.9	63.3
Wholesale price froz. brown (5-lb. pkg.) Chicago, Ill.:					
December	-	101-107	91-92	68-70	64-66
November	71-78	105-110	89-92	69-73	60-65
October	67-75	108-115	83-90	69-73	59-62
September	73-77	113-118	87-90	65-70	62-64
August	75-81	110-112	76-91	64-67	62-64
July	80-97	3/	70-75	72-77	62-74
June	95-102	102-104	67-72	76-77	73-74
May	98-103	96-103	67-69	74-77	70-76

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3. The figures in the section (Quantity canned, Gulf States) have been completely revised beginning with February 1963 on the basis of a new conversion factor (formerly 33.0 pounds per case).
2/Raw headless only; excludes breaded, peeled and deveined, etc.
3/Not available.
4/Inventory of June 30, 1963, includes 667,000 pounds; July 31, 1963, includes 925,000 pounds; August 31, 1963, includes 1,011,000 pounds; September 30, 1963, includes 2,868,000 pounds; and October 31, 1963, includes 1,203,000 pounds for firms not reporting previously.
5/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
6/Range in prices at Tampa, Fla.; Morgan City, La., area; Port Isabel and Brownsville, Texas, only.
Note: Data for 1963 are preliminary. November 1963 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

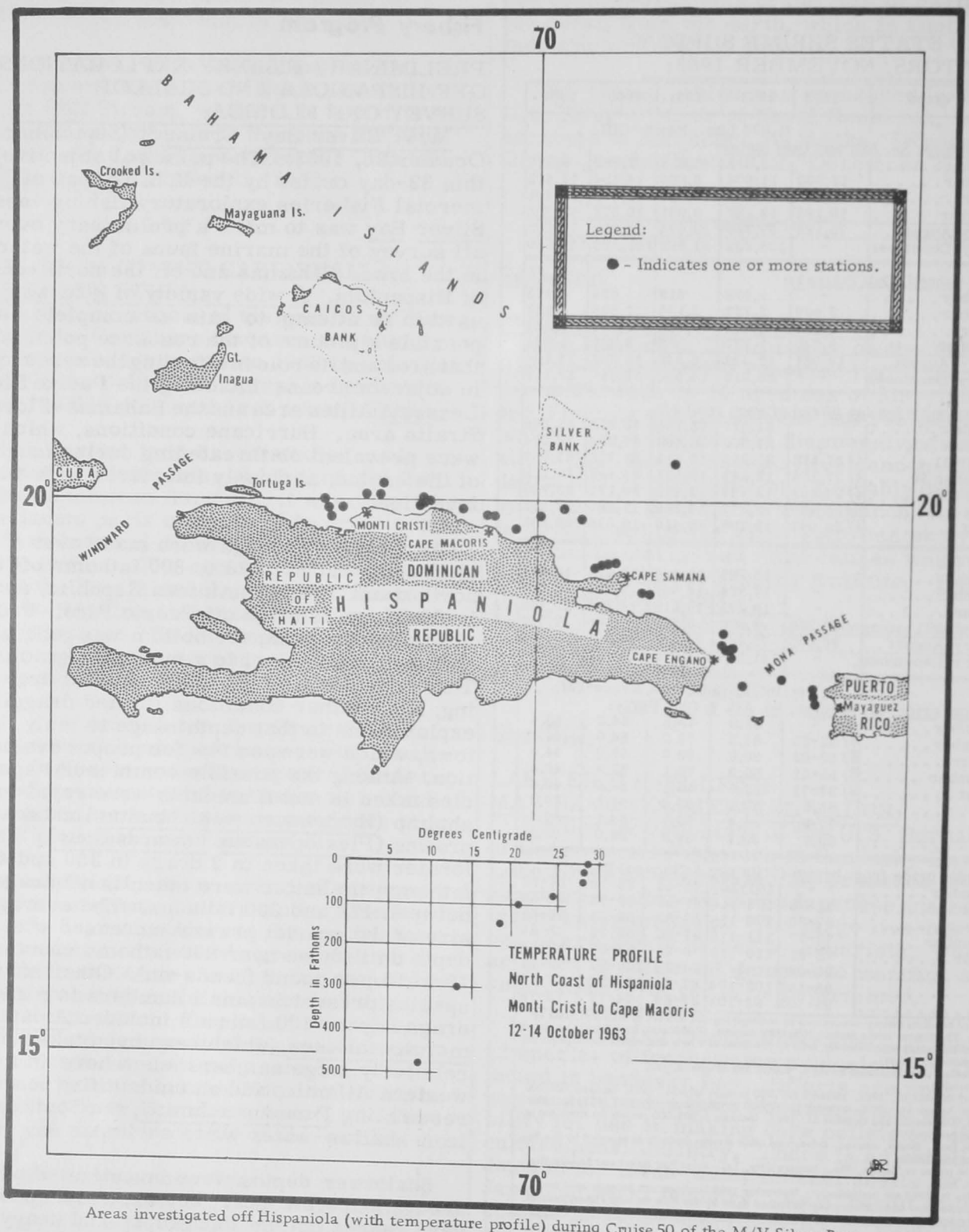
South Atlantic Exploratory Fishery Program

PRELIMINARY FISHERY EXPLORATIONS OFF HISPANIOLA AND SCALLOP SURVEY OFF FLORIDA:

M/V "Silver Bay" Cruise 50 (September 25-October 26, 1963): The principal objective of this 32-day cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay was to make a preliminary overall survey of the marine fauna of the waters in the lower Bahamas and off the north coast of Hispaniola. A wide variety of gear was used in an attempt to gain as complete as possible a picture of the resource potential of that area and its role in affecting the resources in adjacent areas--including the Puerto Rico-Lesser Antilles area and the Bahamas-Florida Straits area. Hurricane conditions, which were prevalent or threatening during much of the cruise, seriously interfered with the investigation.

Shrimp trawl drags were made over a total depth range of 25 to 800 fathoms off the north coast of the Dominican Republic, and in the Mona Passage off Puerto Rico. From 110 to 800 fathoms, the bottom was generally soft mud and subject to a moderate gradient. This provided conditions suitable for trawling, but weather conditions limited dragging explorations in that depth range to only 14 tows, which were too few for proper evaluation. Among the possible commercial species taken in small amounts were royal-red shrimp (Hymenopenaeus robustus) and scarlet prawns (Plesiopenaeus edwardsianus). The former were taken in 2 drags in 350 and 400 fathoms; the latter were taken in all drags between 170 and 800 fathoms. The average size of the scarlet prawns increased with depth until those near 800 fathoms counted 10 to 15 per pound (heads-on). Other shrimp species present in small numbers in a few drags beyond 100 fathoms included Aristaeomorpha folicaea, which have been taken in relatively large numbers elsewhere in the western Atlantic, and an unidentified penaeid resembling Penaeus schmitti, the South American shallow-water white shrimp.

Shallower depths were investigated with dredge and trawl gear, but were marked by very rugged bottom topography and heavy concentrations of coral, rock, and sponge, indicating a general unsuitability for commercial fishing with conventional trawls. Commercial



Areas investigated off Hispaniola (with temperature profile) during Cruise 50 of the M/V Silver Bay.

species of shrimp were present in small numbers in less than one-third of the drags made in 25 to 100 fathoms.

Two 60-hook tuna long-line sets were made off the north coast of the Dominican Republic along the 1,500-fathom isobath. The resulting

total catch consisted of four whitetip sharks. Sampling of surface and subsurface resources was also conducted with midwater trawls, plankton and larval trawls, and suspended wire fish traps. The catches were preserved for scientific study. Trolling lines set whenever the vessel was running between stations, took small numbers of dolphin, rainbow runners, and barracuda. Despite careful bridge watch, no surface fish schools were seen during the cruise.

Throughout the area surveyed off Hispaniola, bottom temperatures averaged lower than at equal depths in areas farther north and south. The fauna was distributed bathymetrically at correspondingly deeper levels, thereby adding additional evidence of the importance of temperature as an environmental factor in marine distribution.

The first part of the cruise included a brief re-survey of the scallop potential on the Florida east coast scallop bed. Thirty-two scallop stations were sampled between Bethel Shoals and Cape Canaveral in the 15 to 50 fathoms depth range. Catches of young scallops, 25 to 35 millimeters (0.98 to 1.18 inches) in width, ranged from 0.1 to 4.0 bushels per 30-minute drag (average 0.6 bushel) at 20 of the stations. This was indicative of the strong year-class of scallops which should reach commercial size during 1964. Catches of commercial size scallops ranged from 0.2 to 2.5 bushels per 30 minute drag (average 1.1 bushels) at 10 of the stations. Those scallops yielded approximately 85 meats per pound and the best catches were made in 27 fathoms off Cape Canaveral.

Tuna

AGE-GROWTH STUDIES OF BLUEFIN TUNA LANDED IN CALIFORNIA:

The California Department of Fish and Game's expanded bluefin tuna research program includes an assessment of the age composition of the California catch. Scales were chosen for preliminary age determination studies because they were easy to collect, process, and read, compared to such structures as otoliths and vertebrae.

Although untreated scales usually are difficult to read and require much individual handling, some difficulties were resolved by eosin staining, cleaning with potassium hydroxide, and using automatic tissue-processing equipment. Crossing-over of circuli in the lateral fields and their crowding in the anterior field were diagnosed as annuli. Although scales from small fish exhibited crossing-over, this characteristic seldom was found in large fish because the lateral fields were obscured by scale thickening and circuli erosion. Scales from the caudal peduncle usually were clear and their annuli distinct compared to scales from beneath the second dorsal fin, although these were generally satisfactory.

The initial study included 247 bluefin tuna ranging from 51 to 142 centimeters (20.1 to 55.9 inches) fork length, collected from commercial landings at Terminal Island, Calif., during 1961 and 1962. An effort was made to sample 10 fish in each interval of 1 centimeter (0.394 inch), but several groups were not represented completely. About 50 percent of the samples could not be read because the scales were blistered, saturated with oil, or otherwise disfigured.

Length of Bluefin Tuna in Age Groups I through V Years

Age Group	Mean Length		Length Range	
Years	Cms.	Ins.	Cms.	Ins.
0	57.10	22.50	51-69	20.1-27.2
I	72.08	28.40	54-92	21.3-36.2
II	90.65	35.72	77-112	30.3-44.1
III	106.95	42.14	100-128	39.4-50.4
IV	128.50	50.63	124-135	48.9-53.2
V	142.00	55.95	142	55.9

Apparently bluefin grow rapidly, increasing in length about 15 to 21 centimeters (5.9-8.3 inches) per year. The mean length at each age compares reasonably well with length-frequency modes determined from market sampling. But additional corroborative evidence, such as growth records from tagging experiments, and serial collections of larval and juvenile fish, is needed. (California Department of Fish and Game, May 1963.)

United States Fisheries

COMMERCIAL FISHERY LANDINGS, JANUARY-SEPTEMBER 1963:

Total Landings: Fish and shellfish landings in the United States the first 10 months of 1963 were down 16 percent as compared with the same period of 1962. Landings were about 633 million pounds less than in 1962--due mainly to reduced catches of menhaden, ocean perch, Atlantic herring, and Alaska salmon.

Menhaden: Landings to October 31, 1963, totaled about 1.6 billion pounds--598 million pounds less than during the same period of 1962. The 10-month production was down in every State.

United States Commercial Fishery Landings of Certain Species for Periods Shown, 1963 and 1962				
Species	Period	1/1963	1962	Total 1962
		(1,000 Lbs.)		
Anchovies, Calif. 2/. .	9 mos.	2,200	1,750	2,252
Cod:				
Maine	8 mos.	1,600	1,740	2,260
Boston 3/	10 "	16,900	19,554	21,213
Gloucester 3/	10 "	2,800	3,156	3,823
Total cod		21,300	24,450	27,296
Haddock:				
Maine	8 mos.	1,600	1,453	2,545
Boston 3/	10 "	69,400	74,663	83,058
Gloucester 3/	10 "	14,100	13,565	16,089
Total haddock		85,100	89,681	101,692
Halibut: 4/				
Alaska	9 mos.	21,800	27,041	27,496
Wash. & Oreg.	9 "	11,000	11,925	12,404
Total halibut		32,800	38,966	39,900
Herring, Maine	9 mos.	130,900	141,807	156,699
Industrial Fish, Me. & Mass. 5/	10 mos.	46,100	29,285	42,741
Mackerel:				
Jack 2/	9 mos.	67,100	43,516	93,414
Pacific 2/	9 "	22,700	25,034	44,980
Menhaden	10 mos.	1,557,300	2,155,458	2,249,900
Ocean perch:				
Maine	8 mos.	46,400	50,800	69,453
Boston	10 "	900	655	909
Gloucester	10 "	39,000	51,051	53,619
Total ocean perch		86,300	102,506	123,981
Salmon, Alaska	1963	214,300	280,000	280,000
Sardine, Pacific	10 mos.	5,700	14,547	15,363
Scallops, sea, New Bedford (meats)	10 mos.	14,200	16,919	19,309
Shrimp (heads-on):				
So. Atl. & Gulf	10 mos.	181,100	136,992	167,804
Washington	9 "	900	1,380	1,400
Squid, Calif. 2/	9 mos.	7,300	7,056	7,056
Tuna, Calif.	10 mos.	248,600	250,444	284,559
Tuna, Atlantic	1963	11,700	7,213	7,213
Whiting:				
Maine	8 mos.	15,900	17,468	17,832
Boston	10 "	100	193	212
Gloucester	10 "	46,400	51,018	53,183
Total whiting		62,400	68,679	71,227
Total all above items		2,798,000	3,435,683	3,736,786
Other 6/		640,300	635,451	1,502,914
Grand total		3,438,300	4,071,134	5,239,700

1/Preliminary.
2/Cannery receipts.
3/Landed weight.
4/Dressed weight.
5/Excludes menhaden.
6/Includes landings for species not listed.
Note: Finfish generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meats only.

Salmon: On the basis of the reported pack of canned salmon, it is estimated that the 1963 catch in Alaska was approximately 214 million pounds--about 66 million pounds less than in 1962.

Shrimp: There was a significant gain in landings of South Atlantic and Gulf shrimp during the first 10 months of 1963 due to sharply increased landings in the Gulf States. Production in the South Atlantic and Gulf areas totaled 181 million pounds--an increase of 44 million pounds or 32 percent over the same period in 1962.

Tuna: Landings (including bonito) in California amounted to nearly 252 million pounds at the end of October 1963--about the same as in 1962. Atlantic Coast landings in 1963 amounted to 11.7 million pounds as compared with 7.2 million pounds in 1962. Although information on Oregon and Washington landings is not available, it is known that a good run of albacore occurred in the Pacific Northwest, and it is believed that the catch exceeded the 9.2 million pounds in 1962.

Ocean Perch: During the first 10 months of 1963, landings at Gloucester, Mass., totaled 39 million pounds--down about 12 million pounds from 1962--while Maine landings for the first 8 months of 1963 were 46 million pounds--a decrease of over 4 million pounds.

Mackerel: Pacific mackerel landings through September 1963, amounted to 23 million pounds--down 2 million pounds as compared with the same period in 1962. Landings of jack mackerel (67 million pounds) increased about 24 million pounds.

* * * * *

FISH STICKS AND PORTIONS, JULY-SEPTEMBER 1963:

United States production of fish sticks and portions amounted to 37.2 million pounds during the third quarter of 1963, according to preliminary data. Compared with the same quarter of 1962, this was a gain of 2.6 million pounds or 7 percent. Fish sticks (16.4 million pounds) were up 274,000 pounds or 2 percent, and portions (20.8 million pounds) were up 2.3 million pounds or 12 percent.

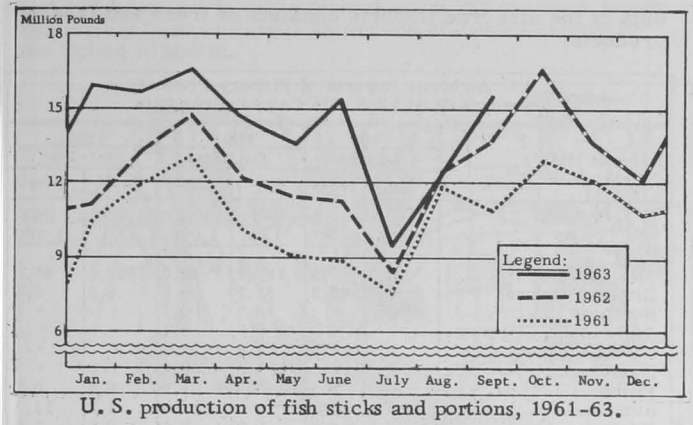
Cooked fish sticks (15.2 million pounds) made up 93 percent of the July-September 1963 fish stick total. There were 20.1 million pounds of breaded fish portions, of which 16.2 million pounds were raw. Unbreaded portions amounted to 765,000 pounds.

Table 1 - U.S. Production of Fish Sticks by Months and Type, July-September 1963 1/			
Month	Cooked	Raw	Total
	(1,000 Lbs.)		
July	4,487	368	4,855
August	5,425	250	5,675
September	5,335	491	5,826
Total 3rd Qtr. 1963 1/	15,247	1,109	16,356
Total 3rd Qtr. 1962	14,725	1,357	16,082
Total 1st 9 mos. 1963 1/	55,412	3,244	58,656
Total 1st 9 mos. 1962	49,238	3,949	53,187
Total Jan.-Dec. 1962	66,801	5,416	72,217

1/Preliminary.

Table 2 - U. S. Production of Fish Sticks by Areas, July-September 1963 and 1962				
Area	1/1963		2/1962	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	21	12,972	22	12,896
Inland & Gulf States	5	1,900	5	1,766
Pacific Coast States	10	1,484	9	1,420
Total	36	16,356	36	16,082

1/Preliminary.
2/Revised.



U. S. production of fish sticks and portions, 1961-63.

Table 3 - U.S. Production of Fish Sticks by Months, 1959-1963

Month	1/1963	2/1962	2/1961	1960	1959
	(1,000 Lbs.)				
January	7,634	6,082	6,091	5,511	6,277
February	8,246	6,886	7,097	6,542	6,352
March	7,846	7,658	7,233	7,844	5,604
April	6,687	5,719	5,599	4,871	4,717
May	6,165	5,643	5,129	3,707	4,407
June	6,538	5,117	4,928	4,369	4,583
July	4,855	3,740	3,575	3,691	3,790
August	5,675	5,760	6,927	5,013	3,879
September	5,826	6,582	5,206	5,424	5,353
October	-	6,698	6,133	6,560	5,842
November	-	6,305	6,288	6,281	4,831
December	-	6,027	5,618	5,329	4,743
Total	-	72,217	69,824	65,142	60,378

1/Preliminary.
2/Revised.

Table 4 - U.S. Production of Fish Portions by Months and Type, July-September 1963 1/

Month	Breaded			Unbreaded	Total
	Cooked	Raw	Total		
	(1,000 Lbs.)				
July	823	3,552	4,375	225	4,600
August	1,149	5,241	6,390	254	6,644
September	1,839	7,453	9,292	286	9,578
Tot. 3rd Qtr. 1963 1/	3,811	16,246	20,057	765	20,822
Tot. 3rd Qtr. 1962	3,059	14,998	18,057	489	18,546
Tot. 1st 9 mos. 1963 1/	11,943	54,917	66,860	2,214	69,074
Tot. 1st 9 mos. 1962	9,875	43,953	53,828	1,554	55,382
Tot. Jan.-Dec. 1962	14,007	62,290	76,297	2,381	78,678

1/Preliminary.

The Atlantic Coast States remained the principal area in the production of both fish sticks and portions, with 13.0 and 11.0 million pounds, respectively. The Inland and Gulf States ranked second with 2.0 million pounds of fish sticks and 9.1 million pounds of fish portions. The remaining 2.1 million pounds of fish sticks and portions were produced by firms in the Pacific States.

Production of fish sticks and portions during the first 9 months of 1963 totaled 127.7 million pounds--19.2 million pounds above the same period of 1962. Fish sticks (58.6 million pounds) were up 5.5 million pounds (or 10 percent) and portions (69.1 million pounds) increased 13.7 million pounds (25 percent).

Table 5 - U. S. Production of Fish Portions by Areas, July-September 1963 and 1962

Area	1/1963		2/1962	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	23	10,997	24	9,550
Inland & Gulf States	6	9,117	12	8,328
Pacific Coast States	9	708	8	668
Total	38	20,822	44	18,546

1/Preliminary.
2/Revised.

Table 6 - U. S. Production of Fish Portions by Months, 1959-1963

Month	1/1963	2/1962	2/1961	1960	1959
	(1,000 Lbs.)				
January	8,199	5,077	4,303	3,632	2,692
February	7,383	6,360	4,902	3,502	3,025
March	8,687	7,036	5,831	4,706	3,225
April	8,004	6,408	4,484	3,492	2,634
May	7,411	5,818	3,879	3,253	2,684
June	8,819	6,137	4,039	3,995	3,247
July	4,600	4,679	3,962	4,088	2,227
August	6,644	6,687	4,963	3,558	2,796
September	9,578	7,180	5,745	4,631	3,558
October	-	9,871	6,759	5,275	4,314
November	-	7,406	5,789	4,790	3,483
December	-	6,019	5,191	4,459	3,262
Total	-	78,678	59,847	49,381	37,147

1/Preliminary.
2/Revised.

U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, SEPTEMBER 1963:

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, September 1963 with Comparison

Area (Home Port)	Sept. 1963	Sept. 1962	Jan.-Sept. 1963	Jan.-Sept. 1962	Total 1962
	(Number)				
Issued first documents 2/:					
New England	1	2	4	24	28
Middle Atlantic	1	-	4	2	3
Chesapeake	8	3	14	29	43
South Atlantic	8	6	15	37	47
Gulf	24	9	59	87	110
Pacific	3	5	10	115	130
Great Lakes	-	1	1	3	5
Puerto Rico	-	-	-	-	2
Total	45	26	107	297	368
Removed from documentation 3/:					
New England	-	5	38	19	24
Middle Atlantic	1	3	42	31	39
Chesapeake	3	2	16	19	23
South Atlantic	2	4	45	29	38
Gulf	9	15	87	86	104
Pacific	3	4	68	82	111
Great Lakes	2	3	13	18	22
Hawaii	2	-	3	3	3
Puerto Rico	-	-	-	1	1
Total	22	36	312	288	365

1/For explanation of footnotes, see table 2.

During September 1963, a total of 45 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 26 in September 1962. There were 22 documents cancelled for fishing vessels in September 1963 as compared with 36 in September 1962.

Table 2 - U. S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, September 1963

Gross Tonnage	Issued 2/	Cancelled 3/
	(Number)	
5-9	8	6
10-19	12	12
20-29	4	2
30-39	6	-
40-49	2	-
50-59	1	-
60-69	3	1
70-79	4	-
80-89	2	-
100-109	-	1
250-259	1	-
530-539	1	-
640-649	1	-
Total	45	22

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
2/Includes 3 redocumented vessels in September 1963 previously removed from records. Vessels issued first documents as fishing craft were built: 31 in 1963; 1 in 1960; 1 in 1958; 1 in 1954; 10 prior to 1951; and 1 unknown.
3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

U. S. Foreign Trade

AIRBORNE IMPORTS OF FISHERY PRODUCTS, AUGUST 1963:

Airborne fishery imports into the United States in August 1963 were up 28.4 percent in quantity and 22.1 percent in value from those in the previous month. Total airborne imports during January-August 1963 showed an increase of 21.1 percent in quantity and 29.6 percent in value from arrivals in the same period of 1962, due mainly to larger shipments of shrimp and spiny lobsters.

Raw headless shrimp continued to make up the bulk of the airborne shrimp imports--in August 1963, shipments consisted of 1,036,590 pounds of fresh or frozen raw headless and 43,708 pounds of frozen peeled and deveined shrimp. All of the airborne shrimp arrivals in August 1963 entered through the U. S. Customs District of Florida.

Airborne imports of shellfish other than shrimp this August consisted of 116,700 pounds of fresh or frozen spiny lobster products, which entered through the Customs District of Florida, 4,600 pounds of fresh or frozen crabmeat, most of which entered through the Customs District of Laredo (Tex.), and 6,700 pounds of unclassified shellfish.

Airborne imports of finfish in August consisted mainly of fresh or frozen fish fillets from Mexico, France, and British Honduras.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.

U. S.1/ Airborne Imports of Fishery Products, January-August 1963 with Comparative Data

Product and Origin2/	1963 August Qty.3/	1963 August Value4/	1963 Jan.-Aug. Qty.3/	1963 Jan.-Aug. Value4/	1962 Jan.-Aug. Qty.3/	1962 Jan.-Aug. Value4/
	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
Fish:						
Mexico	17.3	2.9	195.1	58.8	553.2	99.2
British Honduras	3.8	0.9	37.7	9.5	8.8	2.2
Honduras	-	-	16.5	4.3	-	-
Japan	-	-	2.0	8.2	-	-
United Kingdom	0.2	0.3	1.8	4.5	-	-
Iran	-	-	1.2	7.4	-	-
France	4.5	5.5	5.2	6.1	0.3	0.7
Rumania	-	-	-	-	1.3	11.3
Panama	0.9	0.4	0.9	0.4	7.8	1.3
U.S.S.R.	-	-	26.8	70.2	-	-
Canada	-	-	-	-	21.3	16.9
Costa Rica	-	-	-	-	5.6	0.9
Other countries	-	-	0.8	0.3	0.3	0.8
Total Fish	26.7	10.0	288.0	167.7	598.6	133.3
Shrimp:						
Guatemala	-	-	141.6	74.0	199.6	99.7
El Salvador	12.5	7.2	221.6	150.6	410.1	261.6
Honduras	77.1	40.4	99.8	52.3	-	-
Nicaragua	45.8	13.0	426.0	135.5	977.2	328.6
Costa Rica	80.0	38.0	455.0	217.2	262.4	113.1
Panama	163.1	85.4	1,217.7	647.2	1,127.4	594.7
Venezuela	701.9	294.3	3,730.3	1,749.3	1,980.1	1,048.3
Ecuador	-	-	111.6	39.4	12.2	3.4
France	-	-	2.6	0.9	-	-
Mexico	-	-	13.2	6.9	24.8	9.1
Netherlands Antilles	-	-	-	-	3.1	2.7
Total Shrimp	1,080.4	478.3	6,419.4	3,073.3	4,996.9	2,461.2
Shellfish other than Shrimp:						
Mexico	10.4	7.4	90.0	52.7	50.6	30.4
British Honduras	88.7	78.1	202.2	161.6	141.5	79.8
El Salvador	-	-	5.0	3.6	0.8	0.4
Honduras	-	-	1.9	1.0	113.0	80.7
Nicaragua	27.2	16.7	128.2	79.0	1.2	0.6
Costa Rica	-	-	73.8	60.1	1.4	1.2
Jamaica	-	-	51.0	40.1	30.0	21.3
Netherlands Antilles	-	-	32.8	20.9	15.9	10.0
Colombia	-	-	8.0	21.7	1.8	5.1
Ecuador	-	-	2.2	1.8	1.6	1.2
Tunisia	-	-	0.8	0.9	-	-
Leeward and Windward Islands	-	-	1.6	0.5	22.9	8.6
British Guiana	-	-	1.7	0.3	-	-
Canada	-	-	213.3	109.2	223.4	90.9
Venezuela	-	-	13.7	6.0	22.3	13.6
Panama	1.5	1.2	1.5	1.2	1.0	1.0
Guatemala	-	-	-	-	8.5	4.6
Bahamas	-	-	-	-	1.9	0.8
Dominican Republic	0.2	0.2	22.2	20.9	7.2	5.4
Yugoslavia	-	-	1.2	0.7	-	-
Trinidad	-	-	-	-	2.3	1.0
Other countries	-	-	2.0	2.9	0.6	1.5
Total Shellfish (except shrimp)	128.0	103.6	853.1	585.1	647.9	358.1
Grand Total	1,235.1	591.9	7,560.5	3,826.1	6,243.4	2,952.6

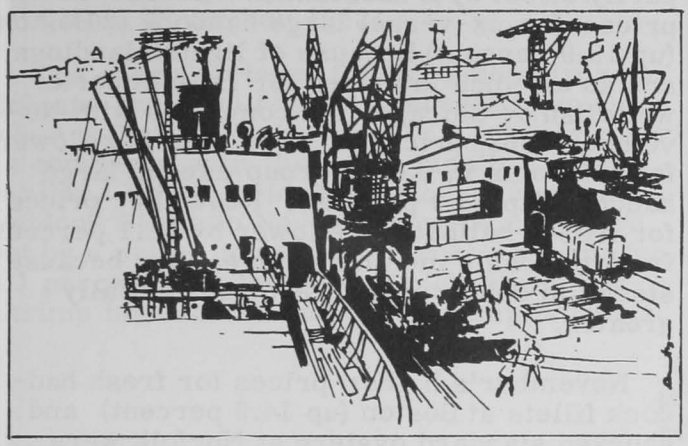
1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.
2/When the country of origin is not known, the country of shipment is shown.
3/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.
4/F.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.
Note: These data are included in the over-all import figures for total imports, i.e., these imports are not to be added to other import data published.
Source: United States Airborne General Imports of Merchandise, FT 380, August 1963, U. S. Bureau of Census.

* * * * *

EXPORTS OF EDIBLE FISHERY PRODUCTS, SEPTEMBER 1963:

Exports of processed fish and shellfish from the United States in September 1963 were up 81.3 percent in quantity

and 133.3 percent in value from those in the previous month due mainly to much larger shipments of canned salmon to the United Kingdom.



Compared with the same month in 1962, the exports in September 1963 were up 16.0 percent in quantity and 90.9 percent in value. The gain in volume was limited by a sharp drop in exports of canned sardines not in oil which partly offset generally higher shipments of most other canned fish export items.

U. S. Exports of Edible Fishery Products, September 1963 with Comparisons

Item	QUANTITY				VALUE			
	Sept.		Jan.-Sept.		Sept.		Jan.-Sept.	
	1963	1962	1963	1962	1963	1962	1963	1962
	(Millions of Lbs.)				(Millions of $)			
Fish & Shellfish:								
Processed only 1/ (excluding fresh & frozen)	2.9	2.5	22.9	23.7	2.1	1.1	10.6	9.9

1/ Includes pastes, sauces, clam chowder and juice, and other specialities.

Processed fish and shellfish exports in the first 9 months of 1963 were down 3.3 percent in quantity but up 7.1 percent in value from those in the same period in 1962. The decline in quantity was due mainly to lower shipments of canned sardines and a drop in exports of canned mackerel to the Congo Republic. There were increases in exports of the higher-priced canned salmon and canned shrimp, as well as larger shipments of canned squid. Although not covered in the table, exports of frozen shrimp were up sharply in the first 9 months of 1963 (increase mostly in exports to Japan), and there was a substantial increase in exports of frozen salmon.

Source: United States Foreign Trade (Trade by Commodity), Summary Report FT 930-E, September 1963, U. S. Department of Commerce.

Note: The quantity of U. S. imports of fishery products is not currently available in summary form.

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IMPORTS OF CANNED TUNA UNDER QUOTA:

United States imports of tuna canned in brine during January 1-November 2, 1963, amounted to 43,462,313 pounds (about 2,069,634 std. cases), according to data compiled by the Bureau of Customs. This was 8.3 percent less than the 47,404,873 pounds (about 2,257,375 std. cases) imported during January 1-November 3, 1962.

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1963 at the 12½ percent rate of duty is limited to 63,130,642 pounds (or about 3,006,221 std. cases of 48 7-oz. cans). Any imports in excess of the quota are dutiable at 25 percent ad valorem.

* * * * *

IMPORTS OF FISH MEAL AND SCRAP BY CUSTOMS DISTRICTS, SEPTEMBER 1963:

U. S. Imports of Fish Meal and Scrap by Customs Districts, September 1963

Customs Districts	September 1963
	Short Tons
Maine and New Hampshire	460
New York (N. Y.)	578
Massachusetts	185
Maryland	1,758
North Carolina	937
Georgia	3,145
Mobile (Ala.)	9,399
Galveston (Tex.)	8,829
Los Angeles (Calif.)	2,643
San Francisco (Calif.)	2,978
Washington	2,125
Dakota	190
Duluth (Minn.) and Superior (Wis.)	435
Michigan	375
Florida	518
Other Customs Districts	111
Total	34,666

Note: A list of the entry ports included within each Customs District is given in Schedule D, Code Classification of United States Customs Districts and Ports, which may be obtained free of charge by writing to the Foreign Trade Division, Bureau of the Census, U. S. Department of Commerce, Washington, D. C. 20233.

Wholesale Prices

EDIBLE FISH AND SHELLFISH, NOVEMBER 1963:

Wholesale prices for edible fish and shellfish (fresh, frozen, and canned) moved slightly downward in November 1963. At 106.1 percent of the 1957-59 average, the November index was lower than the previous month by 0.7 percent. While prices were up or down for specific items in most of the subgroups, the over-all index drop was largely due to more extensive marketing of lower-priced frozen halibut and salmon as a substitute for very light supplies of the fresh product, as seasonal fishing for those species neared an end. Compared with November 1962 (when prices with few exceptions were higher for all products), the index for November 1963 was down 10.3 percent.

From October to November, the drawn, dressed, or whole finfish subgroup index was down 3.8 percent and was lower than in No-

vember 1962 by 3.1 percent. Prices at New York City for western dressed halibut and salmon in November were considerably lower than in October because of the seasonal market transition from the fresh product to the frozen product. Those lower prices were partly offset by a substantial increase in prices for ex-vessel large haddock at Boston (up 19.9 percent) because of lighter landings, and an advance in prices for Lake Superior whitefish at Chicago. As compared with November 1962, prices in November were lower for all items in the subgroup except large haddock (up 43.0 percent). November prices for frozen halibut were lower by 25.1 percent from the same month a year earlier because stocks in cold storage were substantially greater.

November's higher prices for fresh haddock fillets at Boston (up 14.9 percent) and shucked standard oysters at Norfolk were responsible for an 0.6-percent increase from the previous month in the subgroup index for processed fresh fish and shellfish. But those higher prices in November were offset by lower prices for fresh shrimp (down 2 cents a pound at New York). During November fresh haddock fillets were higher-priced (up

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, November 1963 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1957-59=100)			
			Nov. 1963	Oct. 1963	Nov. 1963	Oct. 1963	Sept. 1963	Nov. 1962
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					106.1	106.8	107.1	118.3
Fresh & Frozen Fishery Products:					109.0	110.0	110.6	123.7
Drawn, Dressed, or Whole Finfish:					117.0	121.6	125.6	120.8
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.16	.13	124.7	104.0	98.5	87.2
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.33	.44	97.1	129.9	128.6	129.6
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.89	.95	124.0	132.7	138.0	134.5
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.56	.53	83.6	78.3	100.7	100.7
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.46	.51	75.3	83.5	99.9	88.5
Processed, Fresh (Fish & Shellfish):					107.2	106.6	104.3	124.0
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.54	.47	131.1	114.1	104.4	99.8
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.73	.75	85.0	87.9	83.2	121.9
Oysters, shucked, standards	Norfolk	gal.	7.75	7.63	130.7	128.6	130.7	130.7
Processed, Frozen (Fish & Shellfish):					98.6	97.5	97.4	120.7
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.40	98.9	100.1	100.1	103.9
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.38	.39	111.4	114.3	105.5	107.0
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.34	.34	119.2	118.4	117.5	118.3
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.76	.73	89.5	86.0	90.1	128.7
Canned Fishery Products:					101.2	101.7	101.4	109.4
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	23.25	23.50	101.3	102.4	104.6	111.1
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	10.88	10.88	96.6	96.6	96.6	104.4
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	5.75	5.75	97.5	97.5	97.5	2/101.6
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.84	8.84	113.3	113.3	102.1	119.4

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/ One commodity has been dropped in the fishery products index as of December 1962--"Sardines, Calif., tom. pack, No. 1 oval (15-oz.), 24 cans/cs."--and replaced by "Mackerel, jack, Calif., No. 1 tall (15-oz.), 48 cans/cs." Based on Calif. sardines and not directly comparable with replacement (jack mackerel) for January-November 1963.

31.6 percent) than a year earlier, but fresh shrimp prices were down sharply (30.3 percent)--the subgroup index dropped 13.5 percent from November 1962.

The subgroup index for processed frozen fish and shellfish rose 1.1 percent from October to November but was 18.3 percent lower as compared with the same month a year earlier. Lower prices for flounder and small haddock fillets in November were cancelled out by a price increase for frozen shrimp (up 4.1 percent). In the face of high November shrimp inventories and Gulf shrimp landings that were still at a good level, the advance in frozen shrimp prices at Chicago may be attributed in part to trading in shrimp futures on the commodity exchange in that city.

Slightly lower November prices for canned pink salmon were wholly responsible for a 0.5-percent drop in the price index for canned fishery products from October to November. Prices for other items in the subgroup were unchanged from October. As compared with November 1962, prices for all canned fishery products were lower in November 1963 and the subgroup index was down 7.5 percent.