

TRENDS AND DEVELOPMENTS

Alaska

SOVIET AND JAPANESE KING CRAB VESSELS VISITED BY U. S. BIOLOGISTS:

Following agreements made with the Soviet Union and Japan late in 1964, United States biologists boarded Soviet and Japanese king crab vessels in the Bering Sea in June 1965 as observers. Two American biologists were on the Soviet factoryship Aleksandr Obukhov for two weeks until June 30. Another American biologist observer was aboard the Japanese factoryship Tainichi Maru. Tanner crabs were being processed on the Soviet vessel. All parts of the crabs were kept, with the inedible parts saved for poultry food.

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FOREIGN FISHING ACTIVITY OFF ALASKA, JUNE 1965:

U. S. S. R.: The Gulf of Alaska continued to be the center of Soviet trawling efforts during June. In the eastern Gulf from Cape St. Elias to Dixon Entrance, the size of the fleets declined from about 40 vessels in early June to about 10 by month's end. A small contingent of 1 reefer and 3 trawlers broke away from the Gulf of Alaska fleets about the first of June and spent several weeks off the Washington-British Columbia coasts. Catches of ocean perch from the more southern waters were apparently not too productive as that small fleet returned to the area off southeast Alaska in late June.

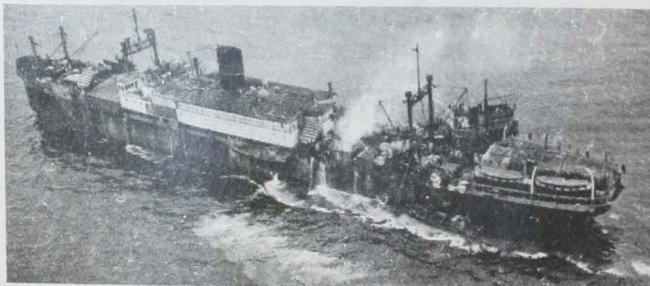


Fig. 1 - Soviet factoryship in Bering Sea.

A slight reduction in the size of the trawling fleets in the central Gulf became evident by the end of June presumably indicating the transfer of vessels to the herring and saury fisheries off the Soviet coasts, which began about late June in previous years. Portlock Bank east of Kodiak was the area most intensely fished by the Soviets, supporting over 100 vessels early in June and declining to about 70 at month's end. Larger numbers of trawlers began operating on Portlock Bank southwest of Kodiak about mid-month and totaled over 30 vessels by the end of June.

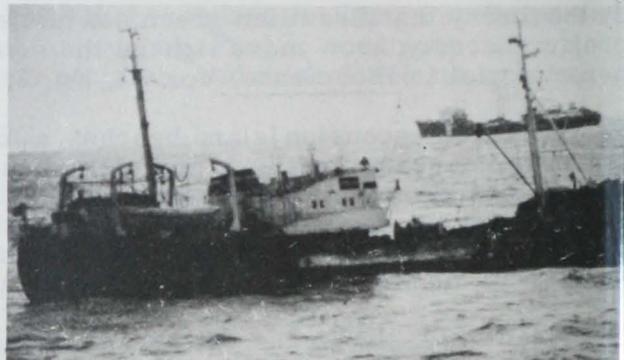


Fig. 2 - New Soviet-type trawler (SRT-M) in foreground fishing for shrimp in Bering Sea. Japanese vessel in background.

In early June a Soviet fleet began building near Seguam Pass in the central Aleutians, which quickly developed into a major fishing effort. The fleet was composed of about 25 trawlers, including at least 12 BMRT factory trawlers, a few reefers, and various support vessels.

Another fleet of about 10 to 15 trawlers, including several factory trawlers, ranged along the western Aleutians throughout June.

Except for the brief time the Soviet factoryship Konstantin Subhanov spent in the western Gulf of Alaska, the 3 king crab fleets remained throughout June in the outer Bristol Bay "flats" northwest of Port Moller.

There were no new sightings in June of Soviet trawlers previously engaged in the shrimp fishery, but it was believed at least SRT-M type trawlers were shrimp fishing east of the Shumagin Islands.

In June, apparently only one Soviet whaling fleet was active in the Alaskan area. That was the Aleut fleet which was believed to have been active primarily in the western Aleutians.

Japan: The factoryship Chichibu Maru and her 12 trawlers continued during June to fish for ocean perch and flatfish in the central and western Aleutians.

The 4 Japanese factory trawlers and 4 smaller side trawlers which were operating in the western Aleutians were not seen in June and had presumably left the Alaska area. No other factory trawlers were believed to be working generally along the 100-fathom curve between the eastern Aleutians and the Pribilof Islands.

The Japanese announced on June 1 that 11 trawling fleets made up of 9 factory trawlers and 14 smaller side trawlers were to be licensed to operate in the Gulf of Alaska this year (1965). This is nearly 4 times the trawling effort the Japanese placed in the Gulf in 1964. By the end of June, 2 of the factory trawlers and a side trawler were working south of Unalaska Island west of Unimak Pass, and in the Gulf of Alaska 2 factory trawlers and 4 side trawlers were active on Albatross Bank south of Kodiak Island.



Fig. 3 - Repairing crab baskets aboard a Japanese crab factoryship.

About mid-June the 3 Japanese fish meal and oil fleets totaling 65 trawlers were no longer operating on the edge of Bristol Bay shelf northeast of Unimak Pass. Those fleets may have followed the pattern of past years and shifted their operational areas to the area northwest of the Pribilof Islands.

The Japanese factoryship Einen Maru and her 15 trawlers continued to operate 40 to 100 miles north of the Pribilof Islands throughout the month in the shrimp fishery.



Fig. 4 - Trawler fishing for Japanese crab factoryship Tokei Maru.

In late May 1965 the Tokei Maru fleet shifted from the accustomed crab grounds off Port Moller to just east of the Pribilof Islands--an area not previously fished intensively by the Japanese king crab fleets. Japanese personnel of that fleet said that the presence of Soviet crab fleets near Port Moller was a significant factor in their decision to move to the Pribilof region. The Tokei Maru fleet operated just east of the Pribilofs throughout June.



Fig. 5 - Hoisting gear in bow of Japanese trawler fishing for factoryship.

The second king crab fleet of the Tainichi Maru remained in the area off Port Miller most of the month, shifting southwest to near Amak Island in late June.

The small Japanese long-line fishing fleet operating in the western Aleutians during May apparently left the Alaska area by early June. Japanese long-line fishing efforts off Alaska had been negligible so far this year, and as far as is known they have not had a long-line fishery for halibut off Alaska in 1965.

Japanese salmon fleets moved just west of the International North Pacific Fisheries Convention (INPFC) salmon abstention line the first days of June but by mid-June after one of their gill-netters was apprehended in violation they had withdrawn to the westward. Intensified United States surveillance patrols in the central Aleutians were terminated on June 18. By that time, the bulk of the maturing Bristol Bay-destined salmon were believed east of the critical corridor between 175° W. to 175° E. and 52° N. to 55° N. The Japanese fleets did not reappear in the corridor during June.

This year the Japanese again sent three whaling fleets to the area off Alaska. A fleet composed of 1 factoryship and 7 whale killers began whaling in the central Aleutians about mid-June and remained in that area for the rest of the month. The other 2 fleets of identical vessel composition were not seen during June but at least one of them was believed working in the Gulf of Alaska.

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NEW FISHING INDUSTRY FOR UNALAKLEET:

A \$42,000 loan for the construction of a new fish-processing and storage facility in Unalakleet has been approved by the Small Business Administration.

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1965 HARVEST KELP AND HERRING ROE:

The southeastern Alaska herring roe industry harvested 467,000 pounds of roe-laden kelp during the 1965 season, a 27-percent increase over the 1964 harvest of 369,000 pounds. The harvest was made in the Craig, Hydaberg, and Sitka areas. A total of 765 persons, working mostly from skiffs, used grapples to pull the heavily laden kelp to the surface, where the fronds with the desirable thickness of roe were picked.

In the Craig and Hydaberg areas spawning occurred over an estimated 20 lineal miles

of beach. The relatively small amount of kelp and herring roe being utilized is reflected in the fact that the harvest in that area took place entirely within a 1-mile area. The proportion was the same for the Sitka area.



Alaska Fisheries Explorations and Gear Development

BOTTOMFISH RESOURCES OFF SOUTHEAST ALASKA STUDIED:

M/V "John R. Manning" Cruise 65-1 (April 29-May 15 and May 20-June 7, 1965): To locate trawlable fishing grounds and to delineate commercial concentrations of bottomfish off southeast Alaska was the primary objective of this 6-week cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John R. Manning. Secondary objectives were to: (1) collect data on the seasonal distribution and abundance of the bottomfish resources of Southeastern Alaska, and (2) collect preliminary data on the biological and environmental factors affecting their distribution and abundance.

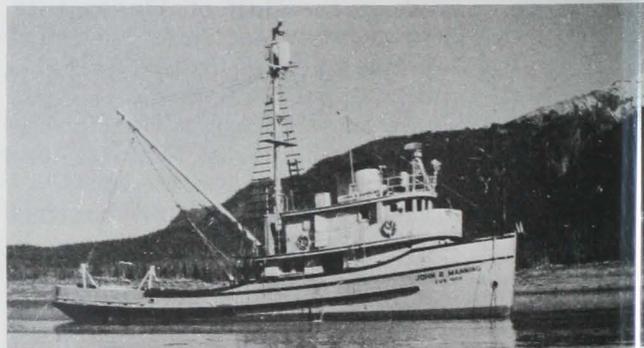


Fig. 1 - M/V John R. Manning of the U. S. Bureau of Commercial Fisheries.

Echo-sounding transects were made to locate trawlable fishing grounds, and areas which appeared to be reasonably level and of soft consistency were fished with a standard 400-mesh Eastern otter trawl. For the most part, sounding effort was concentrated on the Continental Shelf between Coronation and Noyes Islands. Limited sounding transects were also made in the Gulf of Esquibel.

A total of 32 drags lasting about 1-hour each was made in depths from 32 to 138 fathoms. In the shoal area off Noyes Island, catches of 100-130 pounds of marketable rock sole (Lepidopsetta bilineata) were made

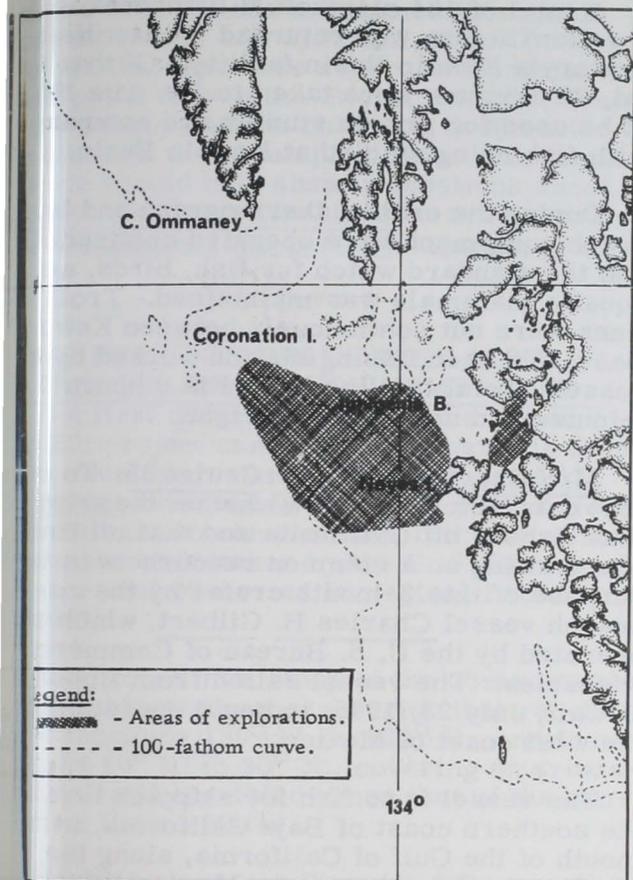


Fig. 2 - M/V John R. Manning bottomfish exploratory cruise 65-1 (April 29-May 15 and May 20-June 7, 1965).

drags. Those drags ranged in depth from 40 to 64 fathoms. In one of the drags, 1,600 pounds of 100-percent marketable grey cod (*Gadus macrocephalus*) were taken.

In the deeper offshore areas, rockfish accounted for a large percentage of the catch. The largest rockfish catch of the cruise (500 pounds) was taken in a drag made in 64 fathoms, 35 miles southwest of Noyes Island. That catch was made up of 20,000 pounds of silver-grey rockfish (*Sebastes trispinis*), 3,000 pounds of widow rockfish (*Sebastes entomelas*), and 490 pounds of spotted rockfish. In two other drags, 375 pounds of silver-grey rockfish were taken in 64 fathoms and 250 pounds of Pacific ocean perch (*Sebastes alutus*) were taken in 138 fathoms.

The 23,500-pound rockfish catch was delivered to the U. S. Department of Agriculture Experimental Fur Farm, Petersburg, Alaska, for use as mink feed.

See Commercial Fisheries Review, August 1965 p. 24.

SHRIMP AND BOTTOMFISH RESOURCES OFF SOUTHEAST ALASKA TO BE STUDIED:

M/V "Commando" Cruise 65-2 (July 7-August 25, 1965): To locate trawlable fishing grounds and delineate commercial concentrations of shrimp and bottomfish off southeast Alaska was the principal objective of this cruise by the exploratory fishing vessel Commando, chartered by the U. S. Bureau of Commercial Fisheries.

Secondary objectives were to: (1) collect data on the seasonal distribution and abundance of shrimp and bottomfish resources of southeastern Alaska, and (2) collect preliminary data on the ability of the 400-mesh eastern otter trawl to fish on rough bottom when equipped with a roller gear.

Shrimp explorations (from 40 to 110 fathoms) and bottomfish explorations (from 10 to 200 fathoms) were to be conducted on the Continental Shelf and Slope of southeastern Alaska from Dixon Entrance to Cape Ommaney.

Methods of operation during the cruise were to include making echo-sounding transects to locate trawlable fishing grounds. The grounds were then to be sampled with a 40-foot Gulf of Mexico-type shrimp trawl or the 400-mesh Eastern otter trawl.



Alaska Fisheries Investigations

KARLUK SALMON MIGRATIONS DELAYED:

Probably due to the recent severe winter, the migrations of Karluk Lake red salmon were late for all stages. This includes movements of fry into Karluk Lake, departure of smolts for the ocean, and arrival of adults from salt water. In southeastern Alaska, the movements and growth of pink and chum fry in salt water have been much different than in 1964, probably due to the cold winter and spring. In the northern part of southeast Alaska the pink juveniles were less abundant and smaller.

RECORD NAKNEK RED SALMON SMOLT RUN SHOWS CHANGES IN PATTERN:

Over 23 million smolts went downstream in the Naknek system--the highest migrator

since records were started in 1956. The previous high was in 1962 when 16.5 million were estimated. Extreme windstorms produced unusually turbid water in the Naknek River which caused a reversal of the normal night migration pattern, and this past spring most of the smolts migrated during the daytime. The 1965 smolt migration was about evenly divided between 2 and 3 years of freshwater residence.



Cans--Shipments for Fishery Products

January-April 1965: A total of 898,911 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-April 1965 as compared with 841,363 base boxes used during the same period in 1964.

January-May 1965: A total of 1,177,997 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-May 1965 as compared with 1,100,728 base boxes used during the same period in 1964. It is believed that larger shipments to the Pacific or Western Area (principally for salmon and tuna) accounted for the small increase in 1965.

Note: 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" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.7 base boxes per short ton of steel.



Central Pacific Fisheries Investigations

SKIPJACK TUNA

BIOLOGICAL STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 82 (May 24-30, 1965): The area of operations during this cruise by the research vessel Charles H. Gilbert of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, was south of Oahu between Kewalo Basin and Browns Camp about 15 miles from shore. Objectives were to: (1) collect and return live mackerel-like species to the Bureau's laboratory behavior tank facilities; (2) collect tuna specimens for density determinations; and (3) determine the weight lost from small, medium, and large skipjack tuna after removal of head and viscera.

A total of 184 skipjack, 3 little tuna, and 2 yellowfin tuna was returned live to the laboratory's Kewalo Basin facility. Of that total, 20 skipjack were taken to Sea Life Park to be used for growth studies and compared with fish being studied at Kewalo Basin.

During the cruise, thermograph and barograph equipment were operated continuously and the standard watch for fish, birds, and aquatic mammals was maintained. Troll lines were out continuously between Kewalo Basin and each fishing station worked by the vessel. Total trolling time was 9 hours 20 minutes and nothing was caught.

M/V Charles H. Gilbert Cruise 85: To collect data which may show whether the skipjack tuna fishery off California and that off Hawaii are drawing on a common resource was the purpose of this 2-month cruise by the research vessel Charles H. Gilbert, which is operated by the U. S. Bureau of Commercial Fisheries. The vessel sailed from Honolulu, Hawaii, July 23, 1965, to begin operations off the west coast of Mexico.

The vessel is to fish for skipjack tuna off the southern coast of Baja California, in the mouth of the Gulf of California, along the Mexican mainland south to Manzanillo, and near the Revillagigedo Islands, 500 miles offshore from Mexico. The area is one in which the California-based tuna fleet makes large skipjack catches.

Object of the cruise is to collect blood and serum samples from skipjack. Samples will be taken off Mexico and from any skipjack that may be encountered in the convergence zone above latitude 10° N., which the vessel will traverse on the way home.

Such blood and serum samples will help provide information on whether the large California fishery and that in Hawaii are drawing on a common resource (that is, whether the skipjack are part of one subpopulation). The California fishery takes about 10 times, by weight, as much skipjack annually as does the Hawaiian fleet.

There already is some evidence that the two fisheries share a common resource, but to what degree is a matter of speculation. The blood and serum samples will be used to distinguish subpopulations of the skipjack. (Subpopulations are groups that are reproductively isolated from other groups of the kind.) Using blood-type techniques developed

fish use with humans and domestic animals adapted for use with tuna, it has been learned that there are several subpopulations of skipjack tuna in the Pacific. Comparison of the subpopulations observed in Hawaiian waters with those sampled in the waters off Mexico should help answer questions about the biological relationship of the two fisheries. See Commercial Fisheries Review, August 1965 p. 28.

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FIRST PHASE OF TRADE WIND ZONE OCEANOGRAPHIC STUDY COMPLETED:

The first phase of an extensive oceanographic project came to an end early in July 1964 when the research vessel Townsend Cromwell returned to her home port of Honolulu, Hawaii, to complete the 16th in a series of cruises undertaken by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu.

The project is a study of the oceanography of the trade wind zone, a region that reaches from longitude 130° W. to 180° E., and from latitude 10° N. to 30° N., covering an area about one and one-third times that of the continental United States.

Working alone, the Townsend Cromwell has been able to investigate only the narrow portion of that region lying north, east, and south of the Hawaiian Islands, an area about twice the size of the State of Texas.

The object of the investigation is to study the seasonal and longer term changes in the distribution of properties in the sea. Those changes are to be examined in terms of the changes in annually repeating processes such as the heat exchange across the sea surface, evaporation minus precipitation, advection, and diffusion. Required for the study are data giving the rate of change as well as the distribution of the properties with time. To find this, sampling has been done at regular, frequent intervals.

The first phase of the investigation is to be followed by a project starting in 1967 in which several vessels will conduct similar investigations over the entire trade wind zone of the North Pacific. The work will last 18 months to 2 years.

The first data from the cruises have been processed and are scheduled to be published as soon as possible. They will be followed up

by a series of descriptive and analytical reports in 1966 and 1967.

In the course of the first phase of the study, the Townsend Cromwell has spent 20 days at sea each month since February 1964, except for August 1964. The vessel has sailed more than 32,000 miles. The pattern for scientific observations during the cruises was established early in the series and did not vary significantly for more than a year. The unchanging routine, in fact, is the heart of the study, since the object is to document month-to-month changes in oceanographic properties in the area. The ultimate aim is to understand the relation of winds and weather to the changes in ocean properties at the surface and to a depth of more than a quarter of a mile, particularly as they affect the commercial fisheries.

The Honolulu Laboratory scientists are finding that the oceanography of the Hawaiian area is complex. Within a depth of a few hundred feet there may be as many as 4 water types which retain their individuality and move with apparent independence of each other.

This finding may have important implications for fisheries, for the depths include those in which commercial fish are caught. This would mean that a fisherman fishing at the surface at a particular location might in 2 months be making his catch in subsurface waters differing in their own ways as sharply as the climates of New Guinea and the Sahara desert and containing different kinds or quantities of fish.

The properties being studied are the temperature of the water, salinity, and the amount of oxygen and phosphorus. All vary according to local influences, but more important according to the past history of the water types.

The pattern for the investigations has included 43 oceanographic stations 90 miles apart. Samples were obtained at 20 depths to about 4,500 feet. Since July 1964, casts to about 12,000 feet were made on three stations. Bathythermographs, which record temperature in the upper layers of the ocean, were taken at 30-mile intervals along the cruise tracks, except at 3 locations on each cruise, where they were taken at 10-mile intervals. In addition, meteorological observations were made, and the radiation from sun and sky recorded.

M/V "Townsend Cromwell" Cruise 16 (May 12-31, 1965): The flow pattern south of 20° N. continued to be setting slightly northwesterly as in the previous month but not quite as intensely during this cruise in the central North Pacific by the research vessel Townsend Cromwell. The vessel completed this cruise in a series of oceanographic cruises in the first phase of this study to find the rate of change in the distribution of properties in the trade wind zone of the central North Pacific. The area of operations on this cruise was bounded by latitude 10° N., 27° N. and longitude 148° W., 158° W.

Note: See Commercial Fisheries Review, August 1965 p. 32.



Commercial Fisheries Research and Development Act

GRANT-IN-AID FUNDS APPORTIONED TO STATES FOR FISCAL YEAR 1966:

On July 13, 1965, the U. S. Secretary of the Interior announced the first apportionment--a total of \$4,100,000--in grant-in-aid funds to

Apportionment of Funds for Fiscal Year 1966 Under Section 4 (a) of the Commercial Fisheries Research and Development Act of 1964 1/			
State and Area	Allocations \$1,000	State and Area	Allocations \$1,000
Alabama	40.3	Nevada	20.5
Alaska	246.0	New Hampshire	20.5
Arizona	20.5	New Jersey	167.5
Arkansas	20.5	New Mexico	20.5
California	246.0	New York	178.7
Colorado	20.5	North Carolina	52.3
Connecticut	20.5	North Dakota	20.5
Delaware	38.7	Ohio	45.7
Florida	246.0	Oklahoma	20.5
Georgia	94.6	Oregon	118.3
Hawaii	35.0	Pennsylvania	56.6
Idaho	20.5	Rhode Island	26.6
Illinois	24.4	South Carolina	21.6
Indiana	20.5	South Dakota	20.5
Iowa	20.5	Tennessee	20.5
Kansas	20.5	Texas	246.0
Kentucky	20.5	Utah	20.5
Louisiana	246.0	Vermont	20.5
Maine	223.0	Virginia	173.1
Maryland	180.7	Washington	226.3
Massachusetts	246.0	West Virginia	20.5
Michigan	25.3	Wisconsin	20.5
Minnesota	20.5	Wyoming	20.5
Mississippi	129.1	American Samoa	51.6
Missouri	20.5	Guam	20.5
Montana	20.5	Puerto Rico	161.1
Nebraska	20.5	Virgin Islands	20.5
		Total . . .	4,100.0

1/Congress adjourned in 1964 before it was able to appropriate funds to implement Section 4 (a) of the Act for fiscal year 1965. The apportionment for fiscal year 1966 represents the first appropriation by Congress to implement Section 4 (a).

States under the Commercial Fisheries Research and Development Act of 1964.

The money was appropriated by Congress under Section 4 (a) of the Act for biological research and other studies and for support of further development of the commercial fisheries resources of the United States.

Apportionment of the fund is based on the value of the commercial fishing industry in the various States, the Commonwealth of Puerto Rico, American Samoa, Guam, and the Virgin Islands. No State may receive more than 6 percent, or less than one-half of one percent, of the fund.

Under the research and development program, the States are reimbursed for up to 6 percent of the costs of approved projects. The research and development programs are administered by the Department of the Interior's Bureau of Commercial Fisheries.

The tabulation lists the apportionment of funds to each State and other entity for the 1966 fiscal year, which began July 1, 1965. Note: See Commercial Fisheries Review, Dec. 1964 p. 118



Federal Purchases of Fishery Products

DEFENSE SUBSISTENCE SUPPLY CENTER MOVES TO PHILADELPHIA AND CONSOLIDATES WITH DEFENSE PERSONNEL SUPPORT CENTER:

Effective July 10, 1965, the Headquarters Defense Subsistence Supply Center (DSSC) of the Department of Defense was moved from Chicago, Ill., to Philadelphia, Pa., and consolidated with the Defense Medical Supply Center (DMSC) and the Defense Clothing and Textile Supply Center (DCTSC) into one single organization named the Defense Personnel Support Center, located at 2800 South 20th St., Philadelphia, Pa., 19101.

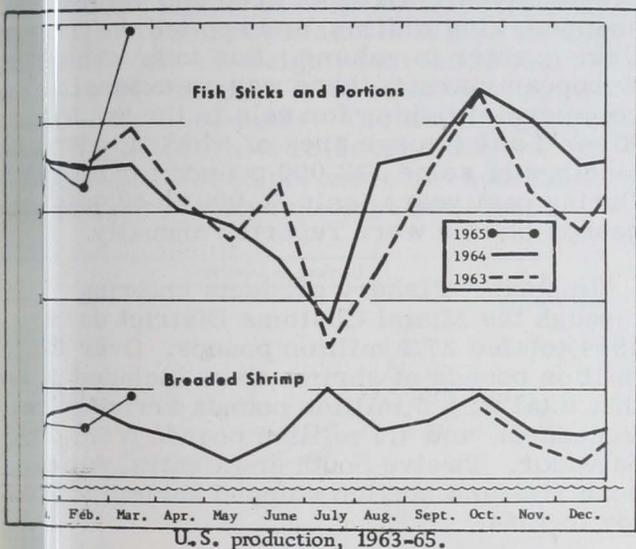
Regional headquarters of the new Center will continue as heretofore: Alameda, Calif.; Brooklyn, N. Y.; Chicago, Ill.; Columbia, S. C.; Fort Worth, Texas; Kansas City, Mo.; Los Angeles, Calif.; New Orleans, La.; Richmond, Va.; and Seattle, Wash.



Fish Sticks and Portions

U.S. PRODUCTION, JANUARY-MARCH 1965:

United States production of fish sticks and fish portions amounted to 50.8 million pounds during the first quarter of 1965, according to preliminary data. Compared with the same quarter of 1964, this was an increase of 3.6 million pounds or 7.7 percent. Fish portions (17.2 million pounds) were up 3.6 million pounds or 13.9 percent, and fish sticks (21.3 million pounds) were up less than 1 percent.



cooked fish sticks (20.2 million pounds) made up 94.9 percent of the January-March 1965 fish stick total. There were 28.8 million pounds of breaded fish portions produced, of which 22.6 million pounds were raw. Unbreaded fish portions amounted to 716,000 pounds.

Month	Cooked	Raw	Total
	. . . (1,000 Lbs.) . . .		
January	6,428	296	6,724
February	6,209	281	6,490
March	7,545	517	8,062
Total 1st Qtr. 1965 1/	20,182	1,094	21,276
Total 1st Qtr. 1964 2/	19,721	1,532	21,253
Total 1964 2/	67,810	5,722	73,532

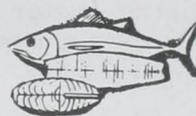
The Atlantic States remained the principal area in the production of both fish sticks and fish portions, with 17.1 and 18.9 million pounds, respectively. The Inland and Gulf States ranked second with 9.9 million pounds of fish portions and about 2.0 million pounds of fish sticks. The remaining 3.0 million

Month	Breaded			Un-breaded	Total
	Cooked	Raw	Total		
 (1,000 Lbs.)				
January	2,210	6,792	9,002	197	9,199
February	1,652	6,424	8,076	180	8,256
March	2,432	9,336	11,768	339	12,107
Tot. 1st Qtr. 1965 1/	6,294	22,552	28,846	716	29,562
Tot. 1st Qtr. 1964 2/	5,393	19,709	25,102	863	25,965
Total 1964 2/	20,956	82,135	103,091	2,541	105,632

1/ Preliminary.
2/ Revised.

pounds of fish sticks and fish portions were produced by firms in the Pacific States.

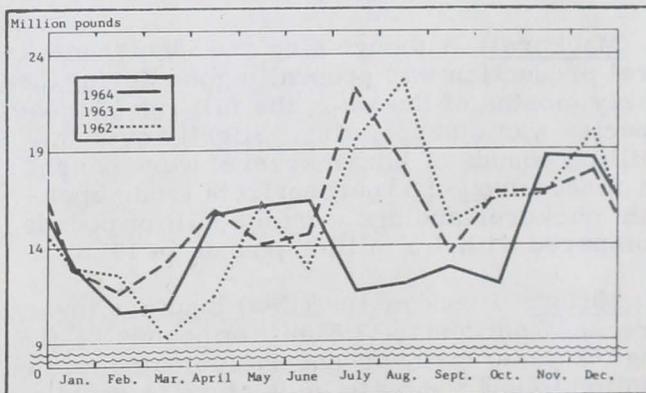
Note: See *Commercial Fisheries Review*, June 1965 p. 20, May p. 19, Jan. p. 28.



Florida

FISHERY LANDINGS AND TRENDS, 1964:

In 1964, the commercial catch of fish and shellfish landed at Florida ports was 178.0 million pounds with an ex-vessel value of \$29.5 million. Compared with 1963, landings decreased 8.2 million pounds, but the value increased \$1.8 million. Landings of shrimp--the leading species--were 44.5 million pounds (heads-on weight) with an ex-vessel value of \$15.3 million. Shrimp, black mullet (lisa), menhaden, and blue crab accounted for 68 percent of total landings. Fourteen species of finfish and four species of shellfish were landed in quantities greater than 1 million pounds.



Shrimp: Despite the fact that many Florida shrimp companies sent more of their vessels to work out of South American ports, domestic landings of shrimp at Florida ports in 1964 increased 5.0 million pounds over the previous year. The value of the 1964 shrimp

catch was up \$1.3 million. In contrast to 1963 when the price of shrimp declined steadily throughout the year, prices increased in 1964. The ex-vessel value of good quality 21-25 count (heads-off) shrimp landed at Tampa increased from 64.75 cents during January to a high of 82.50 cents a pound in December 1964. The market for shrimp remained strong all year.

Oysters: The oyster harvest in 1964 yielded 2.9 million pounds of meats, about 1.5 million pounds less than in the previous year. Florida's principal producing grounds in the Apalachicola-Eastpoint area yielded fewer oysters. However, during the fall season, large quantities of small oysters were observed, indicating better oyster production in the future. Generally, demand and prices were strong throughout the year.

Crab: The blue crab catch amounted to 21.0 million pounds--a decrease of about 3 percent from 1963. Demand for crab meat was strong throughout the year and again many processing firms imported crabs from other states. Generally, wholesale crab meat prices rose about 20 cents a pound over prices received in 1963. Stone crab landings amounted to over 900,000 pounds, an increase of about 15 percent compared with the previous year.

Spiny Lobster: Landings of spiny lobsters amounted to 3.6 million pounds, 1 percent above 1963. Production in the fall season of the year, although normal, failed to meet the demand. Ex-vessel prices to the fishermen increased to 65 cents a pound.

Mackerel: Although king and Spanish mackerel production was generally good during the early months of the year, the fall run of those species was disappointing. Slightly over 3.3 million pounds of king mackerel were caught in 1964, a drop of 33 percent from 1963. Spanish mackerel landings were 5.9 million pounds compared with 7.5 million pounds in 1963.

Mullet: Black mullet (*lisa*) landings increased 5 percent to 37.8 million pounds. During the year, many producers indicated an intention to ask the State legislature to enact a closed season for the period December 20-January 10. The main purpose of the law would be to keep mullet which have recently spawned off the market.

Other Species: Landings of fresh-water catfish were down 22 percent, while bluefish



Fig. 2 - Over-all view of part of a shrimp packing plant in Coral Gables, Fla. Note stainless steel walls.

and spot each declined 12 percent below the previous year. Grouper, red and yellowtail snapper, king whiting, and spotted sea trout were greater in volume. Due to an expanded European market, there was an expansion of commercial fishing for eels in the St. Johns River-Lake George area of Florida, with landings of some 122,000 pounds for the year. During past years, only 30,000 to 40,000 pounds of eels were reported annually.

Imports: Fishery products entering through the Miami Customs District during 1964 totaled 27.1 million pounds. Over 22.9 million pounds of shrimp were included in that total with 6 million pounds arriving from Venezuela and 4.5 million pounds from El Salvador. Twelve South and Central American countries and Mexico shipped shrimp to Florida in 1964.

Processing: In 1964, fishery firms in Florida processed and packaged seafood with a value of about \$56 million at the wholesale level. Over 50 million pounds of processed shrimp (frozen raw headless, breaded, peeled and deveined) valued at almost \$43 million was processed, while Florida's growing crab industry contributed nearly 3 million pounds of crab meat valued at about \$4 million. Other items processed were shucked oysters, fish fillets and steaks, cooked spiny lobster, cooked stone crab claws, turtle chowder, canned mullet, and specialties.

The weather in Florida was generally good for fishing operations during 1964 despite the fact that Hurricanes Cleo, Dora, and Hilary passed over or close to ports of Florida. Very little damage to the fishing fleet or fishhouses occurred as the result of the storms.

Several new and larger snapper vessels were added to the fleet in the northwest section of the State during the year. Shortly after the end of the year, two of those vessels

made a successful trip to waters off the north-west coast of Nicaragua.

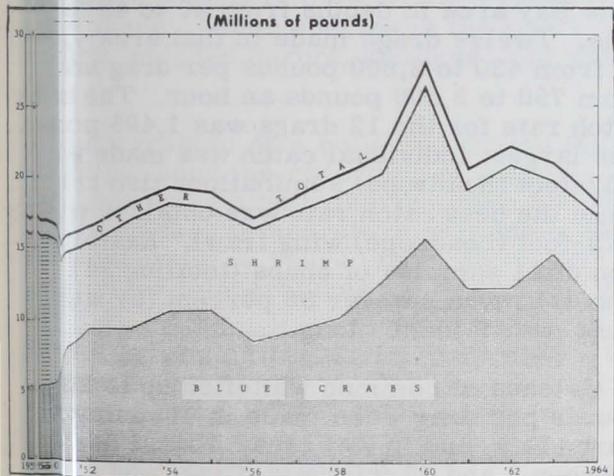
See Commercial Fisheries Review, March 1965 p. 31.



Georgia

FISHERY LANDINGS AND TRENDS, 1964:

Landings of fish and shellfish at Georgia ports during 1964 were 18.3 million pounds, valued at \$3.0 million. Compared with 1963, there was a decrease of 13 percent in quantity, but an increase of 14 percent in value. Shrimp landings (heads-on weight) increased 491,300 pounds, while the blue crab catch was down nearly 3.0 million pounds. The leading species landed during 1964 were blue crab and shrimp. They accounted for 95 percent of the quantity and 61 percent of the value of the 1964 catch.



Georgia landings, 1950-1964.

Shrimp landings during 1964 were 5.9 million pounds (head-on weight), an increase of 9 percent above 1963, but 24 percent less than the average for the 5-year period 1959-63.

The average ex-vessel shrimp price per pound (heads-on weight) during 1964 was 39 cents—6 cents higher than in 1963. The size composition of the 1964 shrimp catch was a factor affecting the average ex-vessel price. During 1963, shrimp of the 21-30 count size made up 20 percent of the landings, whereas in 1964 that size made up 34 percent of the catch.

Blue crab landings were 11.5 million pounds, a decrease of 3.0 million pounds below the previous year. Pot and trap crabs sold for 4 to 6 cents a pound, and otter trawl crabs for 3 to 5 cents a pound during 1964.

Oyster production in 1964 was 195,800 pounds of meats, a decline of 39,600 pounds from 1963.

Landings of all major species of finfish declined during 1964. Fish caught for human consumption decreased from 624,650 pounds in 1963 to 517,277 pounds in 1964.



Great Lakes Fisheries Explorations and Gear Development

LAKE SUPERIOR TRAWLING STUDIES CONTINUED:

M/V "Kaho" Cruise 25 (May-June 1965): The area of operations during this 38-day cruise in Lake Superior by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Kaho was between Munising, Mich., and Duluth, Minn. In addition to seasonal monitoring of previously established stations in the central portion of the lake, the cruise was extended into the western end where preliminary trawling explorations were conducted.

Primary objectives of the cruise were to: (1) determine the availability of various species of fish to bottom trawls; (2) locate additional areas suitable for trawling, particularly west of the Keweenaw Peninsula; (3) demonstrate commercial production potential of chubs with a larger net and longer drags; and (4) study the vertical and horizontal distribution patterns of fish concentrations with an echo-sounder. Other objectives were to: (1) obtain length-frequency data on various species of fish to augment biological studies; (2) collect lake trout biological data; (3) collect fish and bottom material for botulism studies; and (4) collect chub samples for technological studies involving processing methods.

Highlights included the continued success of trawling for chubs in waters first explored immediately adjacent to the eastern side of the Keweenaw Peninsula in 1964 and the attainment of substantial evidence that chubs can be caught readily in trawls on the western side of the peninsula all the way to Duluth.

Initial operations west of the Keweenaw Peninsula were very encouraging with the location of 70 miles of trawlable grounds from

Fourteen Mile Point near Ontonagon, Mich., to a point about 25 miles northeast of Ashland, Wis., and 60 miles of clear bottom from Sand Island (near Cornucopia, Wis.) to Duluth.

The species composition of the total catch of this cruise (21,600 pounds) was 91 percent chubs, 3.5 percent lake trout, 2 percent whitefish, 1.5 percent smelt, and 1 percent suckers.

Concentrations of chubs were located on both sides of the Keweenaw Peninsula. On the east side of the peninsula, consistently good catches were made in depths of 44 to 46 fathoms, while on the western side of the peninsula, best catches occurred between 33 to 37 fathoms. Drags made in the Grand Traverse Bay area yielded catches of chubs up to 2,600 pounds in a one-hour drag with a 52-foot (headrope length) standard trawl net, and 2,200 pounds in 40 minutes with a 70-foot (headrope length) wing trawl. Commercial production potential was also demonstrated west of the Keweenaw Peninsula where a catch of 1,500 pounds of chubs was made in a half-hour drag at 35 fathoms north of Sand Island. A total of 19,500 pounds of chubs was caught during the cruise. Drags producing chubs in amounts ranging from one to 2,600 pounds totaled 25.2 hours of fishing time. Although the production rate was much higher in certain areas and depths, the average catch rate for the 25.2 hours of fishing was 776 pounds an hour, an amount considered of commercial significance. Two-thirds of the total catch of lake trout were taken in water less than 33 fathoms where the average catch of trout per drag was 13 pounds, while in water deeper than 33 fathoms an average of only 6 pounds of trout per drag was taken. Three-quarters of the trout taken in the shallow water were contained in 9 drags and once such concentrations are located they can be avoided. Efforts to return trout to the water in good condition were successful throughout the investigations.

A comparative day-night study was conducted in Keweenaw Bay to determine differences in catch rates. Although slightly more smelt were caught at night in shallower water, the results were inconclusive. During the cruise, demonstrations were made for commercial fishermen and assistance was provided to the experimental commercial trawler Nichevo from Bayfield, Wis.

FISHING OPERATIONS: A total of 79 drags was made during the cruise--70 with a 52-foot (headrope) Gulf of Mexico-type fish trawl and

9 with a 72-foot modified wing trawl. Fifty-one drags were made between Munising and the Keweenaw Peninsula and 28 were made from the Keweenaw Peninsula west to Duluth. All drags were of 30-minute duration except 16 which were terminated early due to encounters with rough bottom or set fishing gear, or for exploratory purposes in unfamiliar waters, or for assessment of commercial potential. Seven drags were extended to one hour to study the production rates of longer drags. Snags were encountered during 7 drags. No damage resulted on 2 of them, minor damage occurred on 2, and major net damage occurred in drags made in 13 fathoms off Superior, Wis., 20 fathoms in Shelter Bay, and 20 fathoms in Keweenaw Bay.

FISHING RESULTS (Munising to Keweenaw Peninsula): Good to excellent catches of chubs were made east of the Keweenaw Peninsula in the Grand Traverse Bay to Bete Gris Bay area in depths from 40 to 45 fathoms. Twelve drags made in that area yielded from 430 to 2,600 pounds per drag and from 750 to 3,300 pounds an hour. The hourly catch rate for the 12 drags was 1,405 pounds. The largest individual catch was made with a 52-foot (headrope) semiballoon fish trawl while the best catch rate was obtained with a 72-foot (headrope) wing trawl. Examination of 11 samples of chubs (totaling 241 pounds) revealed over 86 percent (by weight) were over 9 inches long.

Catches of common whitefish up to 230 pounds per drag were made in Munising Bay, Huron Bay, and in Keweenaw Bay at depths between 8 and 35 fathoms. Cisco and smelt were taken in only small quantities in all areas monitored. Catches of lake trout amounted to about 12.5 pounds per half-hour drag in depths of 32 fathoms and less, and 6.5 pounds per half-hour in depths of 33 fathoms and over. Catches of other species were insignificant and included round and pigmy whitefish, burbot, alewife, and stickleback.

FISHING RESULTS (Houghton, Mich., to Duluth): In the areas monitored from Houghton to Duluth, the heaviest concentrations of chubs were consistently located in depths from 32-37 fathoms. Good catches of chubs (450 and 270 pounds) were taken in the Ontonagon area from Fourteen Mile Point to the Porcupine Mts. Catches ranging from 300 pounds to 1,500 pounds per half-hour were taken in that depth range from an area extending from just north of Sand Island in the Apostles to a point directly north of the

Blue River (12 miles WNW. of Port Wing). Significant amounts of lake trout were taken in many drags east of Bayfield, Wis., while in the Apostle Islands area and off Cornucopia, concentrations of lake trout were heavier. However, trout could be successfully avoided by fishing deeper than 32-33 fathoms. A comparison tow was made with the trawler Nichevo fishing at 33-34 fathoms and the vessel Kaho at 17-28 fathoms. The Kaho took 10 times more trout. In all drags west of the Keweenaw Peninsula the average taken per 30-minute drag was 10 pounds while beyond 33 fathoms the average was 5 pounds per 30-minute drag.

The largest catches of smelt were 35 and 45 pounds taken in 12-13 fathoms off Duluth. Catches of 90 and 100 pounds of longnose suckers were taken in the same area. No other species were taken in significant amounts and only 3 pounds of alewife were taken in all drags made. Other species in the trawl catches included burbot, sculpins, and whitefish.

Hydrographic data collected during the cruise included the recording of thermal gradients using a bathythermograph and continuous surface temperature recorder. Bottom temperatures ranged from 35° to 40° F. and surface temperatures ranged from 35° to 40° F.

See Commercial Fisheries Review, February 1965 p. 22.

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Lake Michigan Trawling Studies Continued:

V Kaho Cruise 26 (June 21-30, 1965): A 10-day exploratory fishing cruise in northern Lake Michigan and Green Bay by the U.S. Bureau of Commercial Fisheries vessel Kaho was completed on June 30, 1965. The primary objective of the cruise was to extend knowledge regarding the seasonal and bathymetric distribution and abundance of alewife, smelt, chub, and yellow perch stocks and their availability to bottom trawls. Secondary objectives were to: (1) collect fish and bottom samples for botulism studies; (2) obtain catch-frequency data on chubs and alewife to complement biological studies; (3) collect stomach samples from alewife; and (4) collect otolith samples for technological studies.

Commercially significant quantities of alewife were taken in all areas monitored with the best catches occurring in the shallow depths, reflecting the seasonal inshore

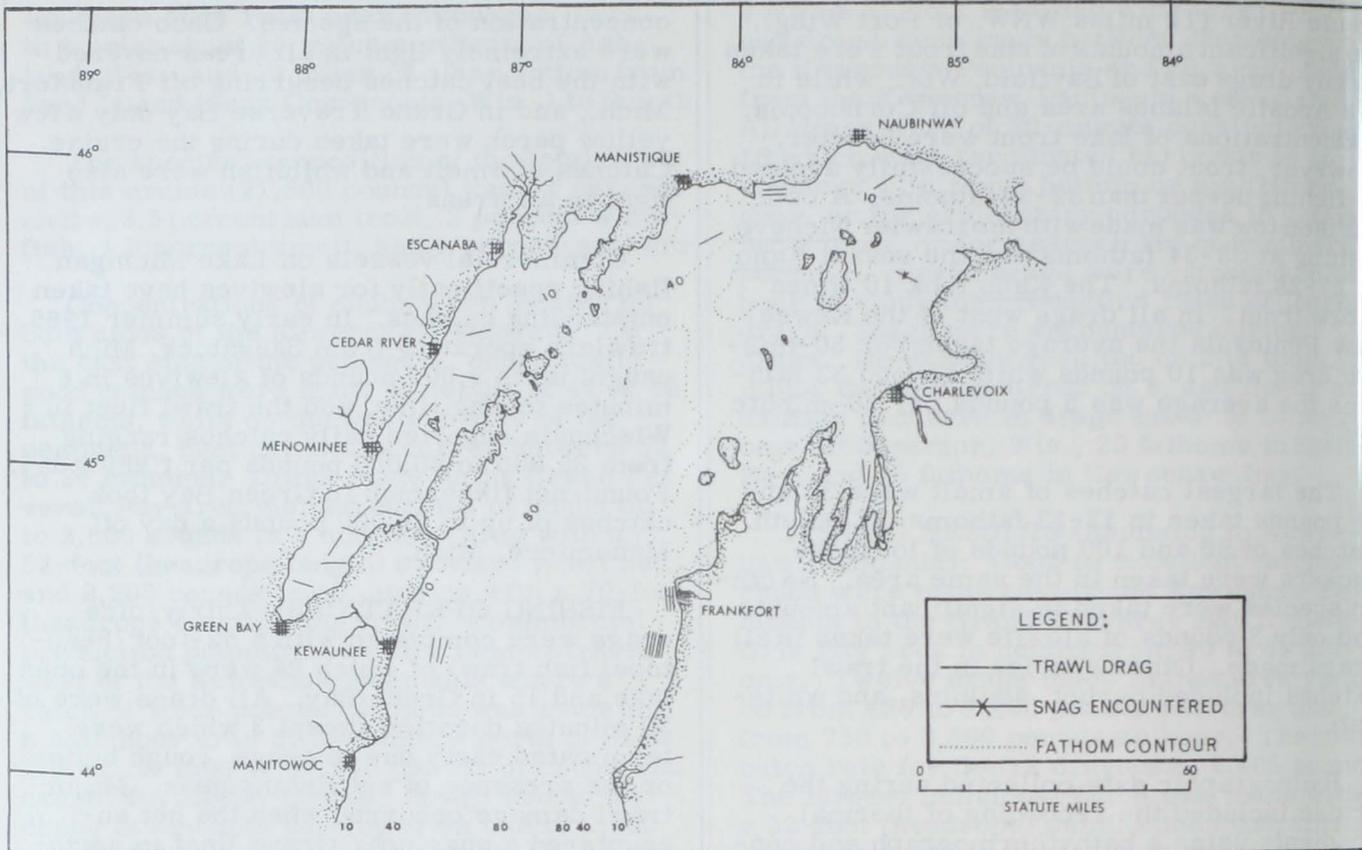
concentration of the species. Chub catches were extremely light in all areas covered with the best catches occurring off Frankfort, Mich., and in Grand Traverse Bay only a few yellow perch were taken during the cruise. Catches of smelt and whitefish were also light in all areas.

Commercial vessels on Lake Michigan fishing specifically for alewives have taken outstanding catches. In early summer 1965, trawlers operating from Saugatuck, Mich. caught up to 9,000 pounds of alewives in 6 minutes towing time, and the trawl fleet in Wisconsin reported daily catches ranging from 25,000 to 80,000 pounds per fishing day. Pound-net fishermen in Green Bay took catches of up to 72,000 pounds a day off Menominee, Mich.

FISHING OPERATIONS: Thirty-nine drags were completed with a 52-foot (head-tope) fish trawl of which 24 were in the open lake and 15 in Green Bay. All drags were of 30 minutes duration except 3 which were terminated early due to snags, rough bottom, or the presence of set fishing gear. Major trawl damage occurred when the net encountered a snag near Grays Reef in northern Lake Michigan. Bottom topography and vertical distribution of fish were continuously monitored and recorded with a high-resolution echo-sounder.

FISHING RESULTS: Northern Lake Michigan: Commercially significant catches of alewife were taken in Grand Traverse Bay at 12 fathoms and in northern Lake Michigan from Manistique to Naubinway at 10, 12, and 22 fathoms. Chub catches were insignificant with the best catches taken at 25 fathoms off Frankfort (270 pounds) and at 45 fathoms in Grand Traverse Bay (200 pounds). Smelt were taken in only minimal amounts. Five yellow perch totaling 8 pounds were taken in Grand Traverse Bay. Whitefish were taken in amounts of up to 35 pounds per drag at 12 fathoms in Grand Traverse Bay, at 14 fathoms off Beaver Island, and at 10 and 12 fathoms in the northern area of the lake between Naubinway and Manistique.

Green Bay: Good Catches of alewife were taken in Green Bay--the best catches, 630 and 950 pounds, occurred at 5 fathoms in the southern area of the bay. Smelt catches were light except for one 480-pound catch taken at 12 fathoms south of Menominee. Only 3 individual yellow perch were taken in all drags made in the bay. Catches of other species were insignificant.



Lake Michigan explorations, M/V Kaho cruise 26.

HYDROGRAPHIC DATA: Surface water temperatures of Lake Michigan ranged from 43° to 55° F; those in Green Bay from 60° to 63° F. Fishing (bottom) temperatures ranged from 39° to 50° F.

Note: See Commercial Fisheries Review, July 1965 p. 22.

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LAKE HURON TRAWLING STUDIES:

M/V Kaho Cruise 27: The U. S. Bureau of Commercial Fisheries research vessel Kaho was scheduled to depart July 14, 1965, on a 22-day exploratory fishing cruise in Lake Huron. The cruise is the first in a series to explore more effective and efficient methods for capturing and handling the fish stocks in Lake Huron.

Saginaw Bay and adjacent waters in central and southern Lake Huron were to be the main areas of operation during the cruise. The primary purpose was to determine the location, bathymetric distribution and relative abundance of various species of fish and their seasonal availability to standard bottom trawls. Mesh-selectivity studies were also

planned with particular emphasis directed towards yellow perch.



Gulf Fisheries Explorations and Gear Development

SHRIMP GEAR STUDIES CONTINUED:

M/V George M. Bowers Cruise 60 (May 24-July 1, 1965): This cruise, which consisted of short trips in St. Andrews Bay, Fla., was a continuation of the Bureau of Commercial Fisheries studies on the electrical parameters necessary to deburrow shrimp from varying bottom types. During the cruise, SCUBA divers recorded the rate of deburrowing and escape reactions of shrimp exposed to different electrical voltages and pulse rates. The 2,200 feet of color motion-picture film exposed during the cruise provided a record of the shrimp behavior under various conditions for detailed study on shore. Divers reported more rapid deburrowing behavior with increased voltages generated within the test area.

shrimp deburrowing behavior from a soft bottom found in St. Andrews Bay was studied during the cruise. Similar behavior observations of shrimp burrowed in hard bottom exposed to various electrical voltages were initiated on the Tortugas fishing grounds during Cruise 59 of the George M. Biers. Those types of behavioral observations will be undertaken on different bottom types on future cruises to determine whether or not the type of substrata affects escape reactions of electrified shrimp.

See Commercial Fisheries Review, July 1965 p. 24.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

I/V "Gus III" Cruise GUS-30 (June 11-24, 1965): Small brown shrimp (68 count) again were evident, as in May, throughout the sample area covered during this cruise. As part of continuing Gulf of Mexico shrimp distribution study, 8 statistical areas were covered by the chartered research vessel Gus III, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Texas.

A total of 27 standard 3-hour tows with a 44-foot flat trawl, 46 plankton tows, 53 bathythermograph (BT), and 176 water (Nansen bottle) casts were made on the cruise.

The best catches of small brown shrimp were made in areas 19 and 20--mostly in the 10-15 fathom depth range. Catches of the same size brown shrimp also were made in trip to 10-fathom depth in several other areas but the amounts taken in each tow were generally small.

In the over 20-fathom depth range in most areas yielded larger brown shrimp of 12-15 count. Areas 16 and 17, in particular, yielded excellent catches (38 and 46 pounds, respectively) of 12-15 count shrimp from 25 fathoms.

White shrimp catches were mostly light in all areas worked but ran to large (15-20 count) shrimp. Areas 16 and 17 yielded the best white catches, with an average catch of 11 pounds in the up to 10-fathom depth from each of those areas. Smaller amounts of white shrimp ranging from 2 to 8 pounds in each tow from other areas worked were also taken in the up to 10-fathom depth.

Only a scattering of pink shrimp were caught during the cruise, mostly all small.

The vessel also occupied a 24-hour current measurement station in 8 fathoms of water south of Morgan City, La., to supplement data previously collected on white shrimp spawning grounds.

Note: See Commercial Fisheries Review, August 1965 p. 40.



Industrial Fishery Products

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

Major Indicators for U. S. Supply, May 1965: United States production of fish meal and fish oil in May 1965 was lower by 27.7 and 25.5 percent, respectively, as compared with May 1964. Production of fish solubles was lower by 19.4 percent.

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, May 1965					
Item and Period	1/1965	1964	1963	1962	1961
. (Short Tons)					
Fish Meal:					
Production:					
May	23,157	32,047	39,902	40,504	34,446
Jan.-May 2/	42,119	47,698	56,216	60,665	48,103
Year 3/	-	235,252	255,907	312,259	311,265
Imports:					
May	30,475	59,543	30,399	25,269	25,116
Jan.-May	165,384	221,914	163,482	114,433	88,509
Year	-	439,143	376,321	252,307	217,845
Fish Solubles 4/:					
Production:					
May	10,364	12,859	16,997	16,786	13,629
Jan.-May 2/	15,970	20,152	27,395	26,762	22,428
Year 3/	-	93,296	107,402	124,649	112,254
Imports:					
May	167	263	438	265	283
Jan.-May	3,006	1,802	2,116	3,418	1,012
Year	-	4,505	7,112	6,308	6,739
. (1,000 Lbs.).					
Fish Oils:					
Production:					
May	22,291	29,939	33,544	33,436	34,674
Jan.-May 2/	34,158	35,763	41,396	41,598	39,339
Year 3/	-	180,198	185,827	250,075	258,118
Exports:					
May	316	9,329	22,150	6,491	3,192
Jan.-May	12,059	56,022	97,551	58,084	47,092
Year	-	151,469	262,342	123,050	122,486

1/ Preliminary
 2/ Data for 1965 based on reports which accounted for the following percentage of production in 1964: Fish meal, 89 percent; solubles, 89 percent; and fish oils, 99 percent.
 3/ Small amounts (10,000 to 25,000 tons) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.
 4/ No homogenized fish was produced in 1964.

* * * * *

Production by Areas, June 1965: Preliminary data on U. S. production of fish meal, oil, and solubles for June 1965 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.

Area	Meal	Oil	Solubles
	Short Tons	1,000 Pounds	Short Tons
June 1965:			
East & Gulf Coasts 2/	42,952	38,286	16,446
West Coast 3/	2,285	305	1,226
Total	45,237	38,591	17,672
Jan.-June 1965			
Total	87,356	72,749	33,642
Jan.-June 1964			
Total	96,651	78,624	39,025

1/Does not include crab meal, shrimp meal, and liver oils.
 2/Includes a small quantity from the Great Lakes.
 3/Includes American Samoa and Puerto Rico.

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Production, May 1965: During May 1965, a total of 23,157 tons of fish meal and 22.3 million pounds of marine-animal oil was produced in the United States. Compared with May 1964 this was a decrease of 3,890 tons of fish meal and about 7.6 million pounds of marine-animal oil. Fish solubles production a-

Product	May		Jan.-May		Total 1964
	1/1965	1964	1/1965	1964	
Fish Meal and Scrap: (Short Tons)					
Herring	2/	-	1,275	415	8,881
Menhaden 3/	18,232	22,700	25,700	25,747	160,349
Tuna and mackerel	1,777	1,486	8,999	6,485	21,113
Unclassified	3,148	7,861	6,145	15,051	34,809
Total	23,157	32,047	42,119	47,698	225,152
Shellfish, marine-animal meal and scrap	4/	4/	4/	4/	10,000
Grand total meal and scrap	4/	4/	4/	4/	235,252
Fish Solubles:					
Menhaden	8,042	9,399	10,189	10,769	68,738
Other	2,322	3,460	5,781	9,383	24,558
Total	10,364	12,859	15,970	20,152	93,296
Oil, body: (1,000 Pounds)					
Herring	2/	-	576	132	10,354
Menhaden 3/	21,758	28,480	31,456	31,543	157,730
Tuna and mackerel	275	221	1,358	1,127	4,816
Other (including whale)	258	1,238	762	2,961	7,298
Total oil	22,291	29,939	34,152	35,763	180,198

1/Preliminary data.
 2/Included in other or unclassified.
 3/Includes a small quantity of thread herring.
 4/Not available on a monthly basis.

mounted to 10,364 tons--a decrease of 2,495 tons as compared with May 1964.

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U. S. FISH MEAL AND SOLUBLES:
 Production and Imports, January-May 1965: Based on domestic production and imports, the United States available supply of fish meal for the first 5 months in 1965 amounted to 207,503 short tons--62,109 tons (or 23.0 percent) less than during the same period in 1964. Domestic production was 5,579 tons (or 11.7 percent) less, and imports were 56,530 tons (or 25.5 percent) lower than in January-May 1964. Peru continued to lead other countries with shipments of 141,119 tons.

The United States supply of fish solubles during January-May 1965 amounted to 18,976 tons--a decrease of 13.6 percent as compared with the same period in 1964. Domestic production dropped 20.8 percent, but imports of fish solubles increased 66.8 percent.

Item	Jan.-May		Total 1964
	1/1965	1964	
Fish Meal and Scrap: (Short Tons)			
Domestic production:			
Menhaden	25,700	25,747	160,349
Tuna and mackerel	8,999	6,485	21,113
Herring	1,275	415	8,881
Other	6,145	15,051	44,909
Total production	42,119	47,698	235,252
Imports:			
Canada	17,020	24,096	54,779
Peru	141,119	181,196	348,022
Chile	3,908	9,104	12,991
So. Africa Rep.	700	6,138	18,593
Other countries	2,637	1,380	4,816
Total imports	165,384	221,914	439,101
Available fish meal supply . .	207,503	269,612	674,353
Fish Solubles:			
Domestic production 2/	15,970	20,152	93,296
Imports:			
Canada	766	877	1,555
So. Africa Rep.	-	705	981
Other countries	2,240	220	1,966
Total imports	3,006	1,802	4,502
Available fish solubles supply	18,976	21,954	97,800

1/Preliminary.
 2/50-percent solids.



Maine

FISHERIES, 1964:

Commercial fishery landings in Maine during 1964 amounted to 192.6 million pounds with an ex-vessel value of \$22.0 million--a decline of 33 percent in quantity, but a gain of 10 percent in value from 1963.

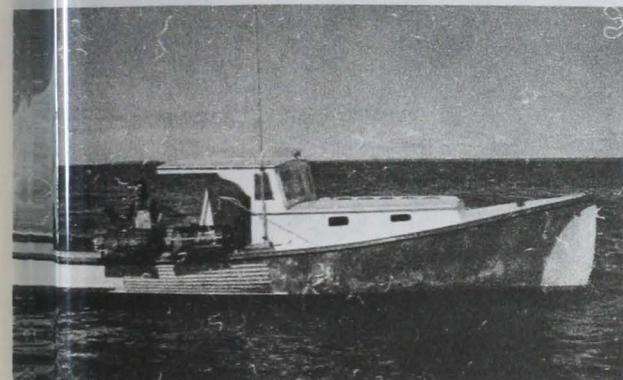


Fig. 1 - Maine fisherman removing lobsters from his traps.

The lobster fishery accounted for most of the increase in value. Maine lobster landings of 14 million pounds in 1964 had an ex-vessel value of \$14.2 million, while lobster landings in 1963 of 22.8 million pounds were worth only \$12.6 million. Lobster landings accounted for 65 percent of the value of the total catch in 1964.



Fig. 2 - Close-up of Maine fisherman digging bloodworms.

The overall decline in 1964 landings was due mainly to a sharp drop in herring landings down from 152.3 million pounds in 1963 to 60.9 million pounds in 1964. Ocean perch landings also dropped from 63.9 million pounds in 1963 to 58.9 million pounds in

1964. The decline was partly offset by an increase in whiting landings from 15.9 million pounds in 1963 to 25.3 million pounds in 1964.

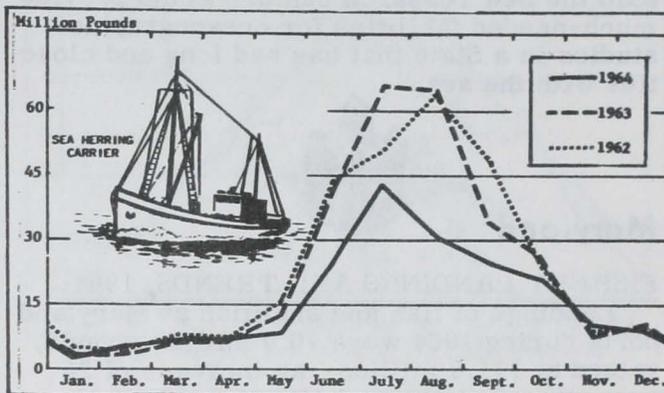


Fig. 3 - Maine landings by months, 1962-64.

Sea herring, ocean perch, whiting, and lobster accounted for 86 percent of Maine's total catch in 1964. Other leading species landed in Maine during 1964 were cod 2.4 million pounds, haddock 2.9 million pounds, white hake 3.5 million pounds, flounder (all species) 1.2 million pounds, mackerel 488,000 pounds, crab 2.0 million pounds, soft clam meats 1.8 million pounds, and sea scallop meats 916,900 pounds. The harvest of sea moss amounted to 2.5 million pounds, and production of blood and sand worms totaled 1.5 million pounds with a value of \$1.2 million.

**UNIVERSITY OF MAINE
RESUMES MARINE RESEARCH:**

Plans to resume a marine research program were announced by the University of Maine in the spring of 1965 after a 130-acre site on the Damariscotta River in Walpole was donated to the University for the establishment of a marine biological laboratory. It will be known as the Ira C. Darling Center for Research, Teaching, and Service.

The location on the Damariscotta River gives protection from the weather while providing access to the ocean. The property also has adequate buildings to house initial research facilities.

Research at the new center, which was scheduled to begin in the summer of 1965, will include the cataloguing and identification of all forms of marine life to be found in the immediate vicinity. Future projects may in-

clude cooperative research with Federal and State agencies.

The president of the University of Maine said the new research center "would provide much-needed facilities for oceanographic studies in a State that has had long and close ties with the sea."



Maryland

FISHERY LANDINGS AND TRENDS, 1964:

Landings of fish and shellfish at Maryland ports during 1964 were 70.0 million pounds, valued at \$11.8 million--an increase of 26 percent in quantity and 10 percent in value as compared with 1963. Blue crabs, soft clams, and oysters accounted for 59 percent of the 1964 catch.

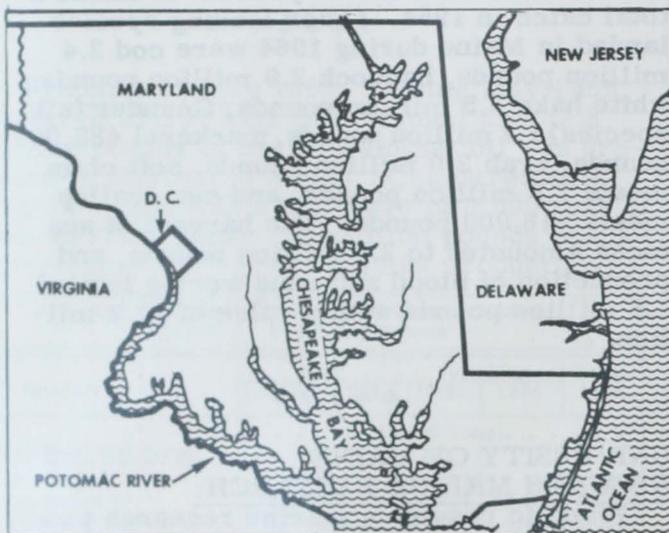


Fig. 1 - Maryland fishing areas.

Crabs: Hard blue crab landings totaled 21.6 million pounds in 1964, an increase of 4.6 million pounds over 1963. Crab ex-vessel prices averaged higher in 1964 as did crab meat prices due to a shortage of crabs for picking.

Soft and peeler crab landings in 1964 totaled 3.5 million pounds (approximately 1,165,900 dozen), a 66-percent increase over 1963.

Soft Clams: Record soft clam landings in 1964 of 680,400 bushels (yielding 8,164,332 pounds of clam meats) represented a 19-percent increase over the 1963 total. The unrestricted clamming allowed in the Potomac River in 1964 contributed to the record catch.



Fig. 2 - Picking crab meat from blue crabs in a Maryland plant.

Ex-vessel prices averaged lower than in 1963 due to the larger supply.

Oysters: The 1964 oyster harvest of 1,702,630 U. S. bushels (yielding 8,104,516 pounds of oyster meats) was up slightly from the 1963 record-low. But the 1964 harvest was the second lowest on record. The spring catch was light as oysters became scarce and their yield was poor. Local packers again purchased shell and shucked oysters from the Gulf States to supply orders. The fall oyster harvest improved considerably over the previous year, although ex-vessel prices were down.

The MSX organism which has caused extensive oyster mortalities in lower Chesapeake Bay extended its range to include larger portions of Tangier Sound and its tributaries along with Pocomoke Sound. Higher salinities over the past two years may have played a roll in the spread of the parasite.

Finfish: Maryland landings of finfish in 1964 totaled 28.2 million pounds valued at \$1.5 million, as compared with 21.1 million pounds valued at \$1.4 million in 1963. The 1964 landings of menhaden (5.7 million pounds) and scarpfish (9.5 million pounds) accounted for much of the increase in quantity.

Landings of striped bass--Maryland's leading foodfish--dropped from 3.7 million pounds in 1963 to 3.3 million pounds in 1964. The white perch catch of 638,232 pounds in 1964 was down sharply from the 1.4 million pounds landed in 1963. Landings of alewife (1.3 million pounds) were also down. The

as a small increase in 1964 landings of shad (90,085 pounds) and fluke (556,521 pounds).

In 1964, five West Coast tuna purse-seine vessels delivered to Maryland 1.4 million pounds of bluefin, 1.1 million pounds of skipjack, and 0.3 million pounds of yellowfin tuna included in the landings were about 0.5 million pounds of tuna caught in the Pacific Ocean).



Massachusetts

FISHERIES, 1964:

Landings of fish and shellfish in Massachusetts in 1964 totaled 409.6 million pounds with an ex-vessel value of \$35.2 million--a decline of 5 percent in quantity and 4 percent in value from 1963. Fishermen landed 33 percent of the 1964 catch at New Bedford, 31 percent at Gloucester, 26 percent at Boston, and 10 percent at other Massachusetts ports.



1 - Mending nets at sea aboard a New England groundfish trawler.

Ocean perch landings at Gloucester dropped from 43.2 million pounds in 1963 to 29.1 million pounds in 1964. That was a major factor in the overall decline in Massachusetts landings.



2 - Fishing trawlers tied up at Boston Fish Pier for unloading. Right in foreground is the New England Fish Exchange building.

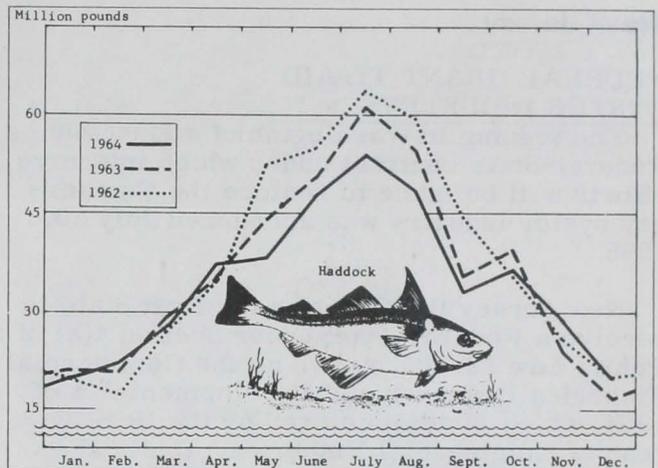


Fig. 3 - Massachusetts landings by months, 1962-64.

At New Bedford, there was a decline of 3.0 million pounds in landings of sea scallop meats, but an increase of 1.9 million pounds in landings of yellowtail flounder. Total landings in 1964 at New Bedford, as well as at Boston, were almost the same as in 1963.

Species	Massachusetts Landings, 1964 and 1963			
	1964		1963	
	Quantity Pounds	Value Dollars	Quantity Pounds	Value Dollars
Alewives, round.	3,998,630	39,985	10,896,830	102,836
Cod, drawn.	29,504,382	2,363,568	31,474,840	2,614,781
Cusk, drawn.	1,683,995	98,107	1,263,762	86,627
Flounders, round:				
Blackback.	13,809,239	1,317,585	11,721,826	1,331,955
Dab.	5,530,718	376,816	4,601,682	352,612
Fluke.	1,358,228	441,591	2,281,417	710,653
Gray sole.	2,906,383	317,347	2,364,250	288,285
Lemon sole.	2,083,829	426,909	1,957,718	487,971
Yellowtail.	70,933,339	4,876,011	68,873,761	4,575,587
Haddock, drawn.	114,261,114	11,556,406	106,074,820	11,442,783
Hake:				
Red, round.	2,875,870	32,790	5,067,852	54,822
White, dressed.	2,426,103	176,677	1,885,190	125,498
Halibut, drawn.	196,699	71,698	154,402	57,166
Herring, sea, round.	1,962,969	36,954	1,850,225	34,785
Mackerel, round.	2,725,435	172,224	1,920,230	184,170
Ocean perch, round.	30,331,669	1,280,520	44,386,697	2,210,985
Ocean pout, round.	2,453,115	32,625	-	-
Pollock.	10,557,807	612,498	10,726,995	595,996
Swordfish, dressed.	870,522	308,396	1,294,746	399,895
Tuna, round:				
Bluefin.	2,058,223	143,482	4,924,034	267,750
Skipjack.	1,154,040	84,269	1,587,585	78,690
Unclassified.	-	-	8,086	1,330
Whiting:				
Round.	56,303,425	1,215,270	61,249,309	1,427,206
Dressed.	1,057,690	47,556	3,322,129	135,686
Wolfish, drawn.	666,938	36,637	598,024	37,413
Unclassified fish.	32,265,091	766,489	31,403,930	746,407
Lobsters, northern.	1,694,511	898,745	1,405,174	657,663
Shrimp.	6,925	916	23,068	2,952
Sea scallop meats.	13,719,185	7,447,125	16,607,715	7,708,620
Squid.	234,140	11,245	1,755,990	94,549
Total.	409,630,214	35,190,441	431,682,287	36,815,673

Note: Includes all Massachusetts commercial landings except a small quantity taken in inshore fisheries. In 1963, the landings shown above accounted for 97.7 percent of the total Massachusetts catch. Weights shown represent fresh fish as landed and the values are those received by the vessels.

Overall Massachusetts landings were down for ocean perch, sea scallop meats, whiting, tuna, cod, fluke, swordfish, alewife, and red hake. But there was a noticeable increase in landings of haddock, most species of flounder (other than fluke), and mackerel.



New Jersey

FEDERAL GRANT TO AID OYSTER INDUSTRY:

The signing in Washington of a \$200,000 Federal-State contract under which intensive efforts will be made to restore the New Jersey oyster industry was announced July 20, 1965.

New Jersey thus became the first State to receive a Federal grant under Section 4(a) of Public Law 88-309, known as the Commercial Fisheries Research and Development Act of 1964, which is administered by the U. S. Bureau of Commercial Fisheries. Under the contract, the State is matching \$100,000 provided by Federal funds.

The New Jersey oyster industry, once valued at more than \$10 million annually, was virtually destroyed in 1957/58 by a shellfish disease known as MSX. Research has shown that a small percentage of the residual oysters may be immune to the disease and by using those survivors as seed, the State hopes to revive the industry in Delaware Bay and the Mullica River.

The New Jersey Commissioner of Conservation and Economic Development said that 2 million bushels of oyster shells will be purchased to improve the setting areas during the present oyster spawning season. It is planned to provide at least a million bushels of shells for that purpose each year for the following 5 years.

The initial planting of shells was expected to be completed in August 1965, and sample tests of the spawning results began in September. All work will be supervised by the Director of the New Jersey Division of Shell Fisheries in conjunction with the Shell Fisheries Council, and the Oyster Research Laboratory of Rutgers--the State University.



North Atlantic

SOVIET FISHING ACTIVITY OFF COAST, JULY 1965:

Soviet fishing activity in the Northwest Atlantic commenced in July 1965 with a fleet of about 100 vessels consisting of 20 factoryship stern trawlers, 69 side trawlers, 7 processing and refrigerated transport vessels, 3 base

ships, and 1 tug. This compared with an estimated 180 vessels sighted in June and 68 vessels in July 1964.

During the month there was a week-by-week decline in vessel activity, so that by the end of July not a single Soviet fishing vessel was reported or sighted on Georges Bank areas south of Nantucket. It was the first time that a complete withdrawal of Soviet vessels occurred during that time of year since they appeared on the scene in 1961. A marked decline in activity was noted in July 1964, but there was a quick return to a large concentrated fleet in August and September. At that time they converged on a tremendous herring fishery during the time of spawning on the Georges Shoals area.

The abrupt shift in activity during July may conceivably be attributed mainly to lagging fish production--principally whiting and herring--and no doubt has prompted a greater emphasis on a known productive whiting area along eastern Nova Scotia. It has been previously reported that the Soviets were taking only moderate catches of fish on Georges Bank and the area south of Nantucket and consequently have deployed their fleet operation accordingly. It was believed this absence of activity might only be temporary.

During July the main Soviet fishing operation was generally confined to an area 30 to 40 miles south of Nantucket Island. United States fishing vessels had abandoned that area some weeks previous due to poor fishing. Small groups of vessels were located along the eastern regions of Georges Bank but were either under way or engaged in vessel repair and replenishing supplies.

As of the end of July it was estimated that 15 factoryship stern trawlers were operating along the Cultivator Shoals area where United States fishermen had reported seeing a large body of whiting.

Note: See Commercial Fisheries Review, August 1965 p. 45.



North Atlantic Fisheries Explorations and Gear Development

SURF CLAM SURVEY CONTINUED:

M/V Delaware Cruise 65-4 (May 3-June 3, 1965): This cruise by the U. S. Bureau

Commercial Fisheries exploratory fishing vessel Delaware off the coast of Virginia was a continuation of an Atlantic surf clam survey conducted during the summer of 1963 and 1964. The survey was initiated in cooperation with the Sea Clam Packers Committee of the Oyster Institute of North America.

Surf Clam Area VI off the coast of Virginia was explored. The size of the area is about 11,000 square miles. The depth of water within the area varies from 4 to 60 fathoms. Although 735 stations were occupied during the cruise, less than one-half of the total area was covered.

The objective of the cruise was to investigate the section of Area VI contiguous to that portion of Area V where concentrations of surf clams had been found previously.

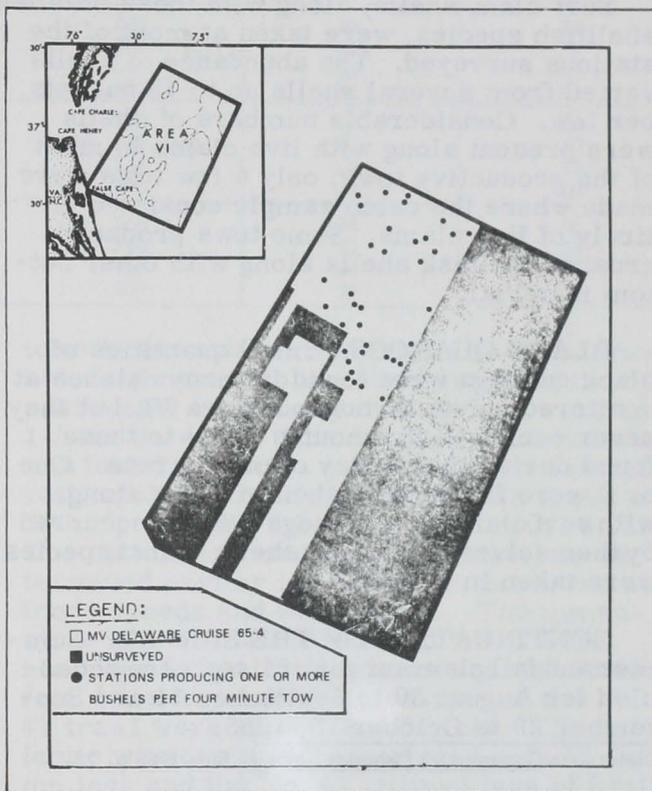
Of the 735 stations occupied, 36 tows were made where the catches from the standard 4-minute tow equaled 1 or more bushels. From the 36 tows, the largest catch was 8.9 bushels. Of the remaining 699 tows, 365 produced catches in amounts less than 1 bushel, and 334 produced none. Of the 699 tows, 365 produced surf clams while the remaining 334 tows yielded no clams.

SURVEY PROCEDURES: The same procedure was followed during this cruise as during past clam surveys. Samples were taken at each survey station with a 48-inch hydraulic dredge. Each sample consisted of the catch from either a 2- or 4-minute tow (depending on the type of bottom) made at the intersection of grid lines spaced 1 mile apart. Operations began at the northern end of the grid line which forms the western boundary of Area VI and proceeded from that point to other parts of the area. Stations occurring in the vicinity of the many wrecks charted in the area were bypassed.

SURF CLAM CATCHES: In the sections of Area VI surveyed, the best concentrations of surf clams were found within a roughly rectangular-shaped plot extending from its northern boundary south to its center (see chart). In the central portion of that plot, however, only one tow was made where the catch exceeded one bushel; south of the rectangular-shaped plot, within the inshore segments surveyed, none of the tows produced more than one bushel of clams.

In the central section of Area VI, just south of the above described rectangular plot, me-

dium clams ($2\frac{1}{2}$ to $4\frac{1}{2}$ inches long) made up almost all of the surf clam populations; those could possibly be the results of one year's spawning. South of that section, and all of the way to the southern boundary of Area VI, only an occasional catch of 1 or 2 surf clams per tow was taken.



Surf Clam Area VI and producing stations during M/V Delaware cruise 65-4 (May 3-June 3, 1965).

The best concentrations of surf clams in Area VI occurred in sections where the bottom was composed mostly of coarse sand, gravel, or sand and gravel mixed. Most of the poorer catches were made where the bottom was predominantly mud, clay, or mud and clay. However, many poor catches did occur in sandy bottom sections throughout the area. In the lower central section of Area VI, many spots of gravel or sand and gravel were found, although they failed to produce any surf clams.

In Area VI the best catches of surf clams were made in depths of water between 17 and 19 fathoms with some good catches occurring as shallow as 13 fathoms and as deep as 20 fathoms.

SIZE OF SURF CLAMS: All sizes of clams were taken except the very smallest (the clam

dredge used was not designed to take very small clams). As in previously surveyed areas, the predominant size group taken was 5 inches or more in length. Medium surf clams made up the bulk of many of the tows from the area. Few clams less than 1.5 inches were taken during the cruise.

Surf clam shells, along with those of other shellfish species, were taken at most of the stations surveyed. The abundance of shells varied from several shells up to 15 bushels per tow. Considerable numbers of shells were present along with live clams in most of the productive tows; only a few tows were made where the catch sample consisted entirely of live clams. Some tows produced crushed mollusk shells along with other bottom material.

BLACK QUAHOGS: Small quantities of black quahogs were found in many catches at scattered points throughout Area VI, but they never occurred in amounts equal to those found during the survey of other areas. One or 2 were frequently taken in a tow along with surf clams; the quahogs seldom occurred by themselves. Very few shells of that species were taken in the area.

CONTINUATION OF THE SURVEY: Summer and fall clam survey cruises were scheduled for August 30 to September 11 and September 29 to October 15, 1965.

Note: See Commercial Fisheries Review, June 1965 p. 28.

* * * * *

TRAWL GEAR EVALUATIONS:

M/V Delaware Cruise 65-5 (June 14-June 25, 1965): The objectives of this cruise were to: (1) measure the in-use dimensions of four trawls of special interest to the east coast fishing industry, and (2) fish two of the trawls comparatively under similar conditions.

MEASUREMENT OF IN-USE DIMENSIONS: The measurements were made with a "sonic" system developed during Delaware Cruises 63-2 and 63-3. The system utilizes echo-sounding transducers mounted on the wings and headrope of the trawl and connected electrically to a sounding machine (fig.). Two traces are printed simultaneously on the recorder. Those traces represent (1) the distance between the center of the headrope and the bottom, and (2) the distance between the wing ends.

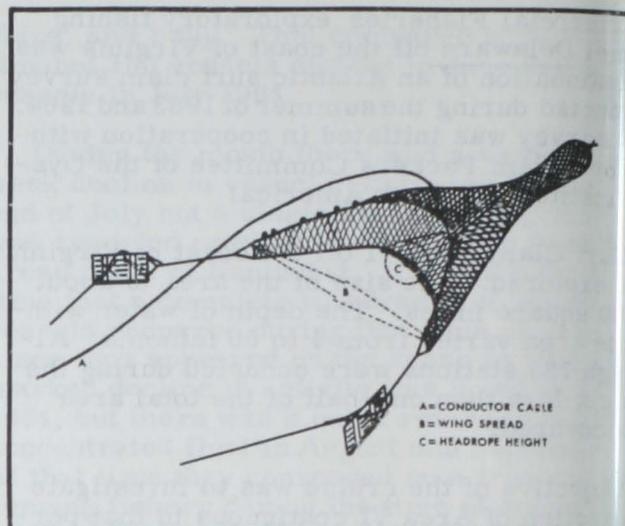


Diagram of otter trawl as rigged for measuring horizontal and vertical openings during fishing operations. Note location of transducers and cables used in "sonic" trawl measuring and telemetering system.

The four nets measured were: (1) a No. 41 otter trawl of No. 54 braided nylon throughout (exclusive of cod end), rigged with 16-inch wooden roller gear; (2) a Skagen type "S" deep-sea wing trawl of polyethylene twine, rigged with 20-inch rubber roller gear; (3) a French Granton trawl of manila and polypropylene twine, rigged with 20-inch rubber roller gear; and (4) an Atlantic western trawl, Model III, of polyethylene twine, rigged with 20-inch rubber roller gear. The cod ends were No. 102 braided nylon. The Atlantic western trawl was fished with one B.M.V. otter boards weighing 2,200 pounds each and measuring 10 feet 4 inches by 5 feet 10 inches. The other 3 nets were fished with rectangular otter boards weighing 1,000 pounds each and measuring 10½ feet by 4 feet.

Trials were carried out on the northern edge of Georges Bank in water 27 fathoms deep. Tests with each trawl were made at three speeds, with two ratios for warp-length to depth, and in four directions. The nets were towed with, against, and across the tidal current to minimize the current effect upon the average measurements for headrope height and wing spread.

The dimensions of each net varied widely due to changes in warp-length, speed, and tidal current. Generally, any factor causing the wing spread to increase would result in a corresponding decrease in headrope height. The largest single variable influencing wing spread was the towing warp-to-depth ratio.

Table 1 - Comparison of Extremes of Wing Spreads and Headrope Heights During Tows

Trawl	Measurement	Warp-to-Depth Ratio	Engine Speed	Wing Spread	Headrope Height
			(r.p.m.)	(feet)	(feet)
No. 41	Max. headrope	3:1	200	52	14
	Min. headrope	4:1	200	50	9
	Max. wing spread	4:1	210	54	9
	Min. wing spread	3:1	200	44	12
Skagen	Max. headrope	3:1	200	36	23
	Min. headrope	4:1	200	51	9
	Max. wing spread	4:1	210	52	9
	Min. wing spread	3:1	200	36	23
Granton	Max. headrope	3:1	210	38	22
	Min. headrope	4:1	190, 200, 210	50	10
	Max. wing spread	4:1	210	56	12
	Min. wing spread	3:1	200	34	20
Atlantic western	Max. headrope	2.5:1	210	36	30
	Min. headrope	4:1	210	50	10
	Max. wing spread	3:1	190	56	18
	Min. wing spread	2.5:1	200	36	30

A 3:1 ratio caused the maximum wingspread in this series. Maximum headrope heights were obtained at a 3:1 ratio, with a sacrifice in wing spread (table 1).

Average headrope height and wing spread of the No. 41 trawl as measured during the cruise were 10 feet and 48 feet, respectively. These figures do not represent the optimum configuration of the net, but an average of the measured heights and of measured spreads of all combinations of warp length, speed, and warp ratio. For the other trawls measured, the average dimensions were as follows (for headrope height and wing spread): Skagen trawl--18 feet and 44 feet, Granton trawl--11 feet and 42 feet, Atlantic western trawl--22 feet and 42 feet.

The Atlantic western trawl had an average headrope height of twice that of the No. 41 and an average wing spread of 6 feet less. The Granton and the Skagen had headrope heights of 5 feet and 8 feet greater than the No. 41 and wing spreads of 6 feet and 4 feet less than the No. 41, respectively. (It is interesting to note that the nylon No. 41 trawl used during this cruise had an average headrope height of from 2.5 to 3 feet greater than that of the No. 41 manila trawl used in previous measurement work.)

COMPARATIVE FISHING--ATLANTIC WESTERN VS. NO. 41 TRAWL: The second purpose of the cruise was designed to study the relative catching efficiency of the Atlantic western trawl as compared to the No. 41 trawl. A towing schedule was set up to equalize the number of tows of each net for each period of daylight and darkness. Three or 4

tows in succession were made with one trawl before changing to the other trawl on the opposite side of the vessel. All tows were of 1-hour duration. The Atlantic western trawl was towed at 210 r. p. m. with a warp-to-depth ratio of 3:1. The No. 41 trawl was towed at 200 r. p. m. with a 3:1 warp-to-depth ratio. The optimum dimensions of the net, as determined earlier in the cruise, occurred at those speeds and warp ratios. The dimensions of the Atlantic western trawl were headrope height 25 feet and wing spread 43 feet. Corresponding dimensions of the No. 41 trawl were 12 feet and 50 feet. The Atlantic western trawl was rigged with 15-fathom legs and the No. 41 utilized legs of 5 fathoms. Ground cables of 10-fathom length were used with each net.

Table 2 - Catch Ratios--Advantage of Atlantic Western Over No. 41 Trawl By Species

Species	Day	Night	Day & Night Combined
 (Catch Ratio 1/)		
Haddock	1.4	2.2	1.7
Cod	2.7	8.0	4.2
Flounders	12.5	2.3	4.5
Skate	8.1	3.4	3.9

1/Catch ratio = $\frac{\text{Total pounds in Atlantic western trawl}}{\text{Total pounds in No. 41 trawl}}$

Areas fished included the Northern Edge, Winter Fishing grounds, Bight of Clarks, the Channel area, and Pollack Rip area, all of which are on Georges Bank or adjacent to it.

On the basis of 40 tows for each net, the combined catch of all species for the Atlantic western trawl was about 2½ times that of the No. 41. The catch advantage for selected species is indicated in table 2.

In evaluating the data, notice must be taken of various factors which might bias the results. Although the gear appeared to be fishing satisfactorily, further tests may reveal the need for minor adjustments in either the rigging of the net or the doors to improve the efficiency of the trawls. Fish were fairly scarce during the trial period; the average catch per 1-hour tow was about 400 pounds total for the species listed in table 2. Also, because of the limited time available, not all types of bottom were fished.

No significant problems were encountered in handling the Atlantic Western trawl. The oval trawl doors were set out without difficulty, and no more time was required to handle either the net or the doors than is usual with a No. 41 trawl. Neither net suffered extensive damage during the trials. Tear-ups were limited to the wing ends in each trawl.

Additional field work is being planned to further evaluate the Atlantic Western trawl

and the other two trawls measured during the cruise.

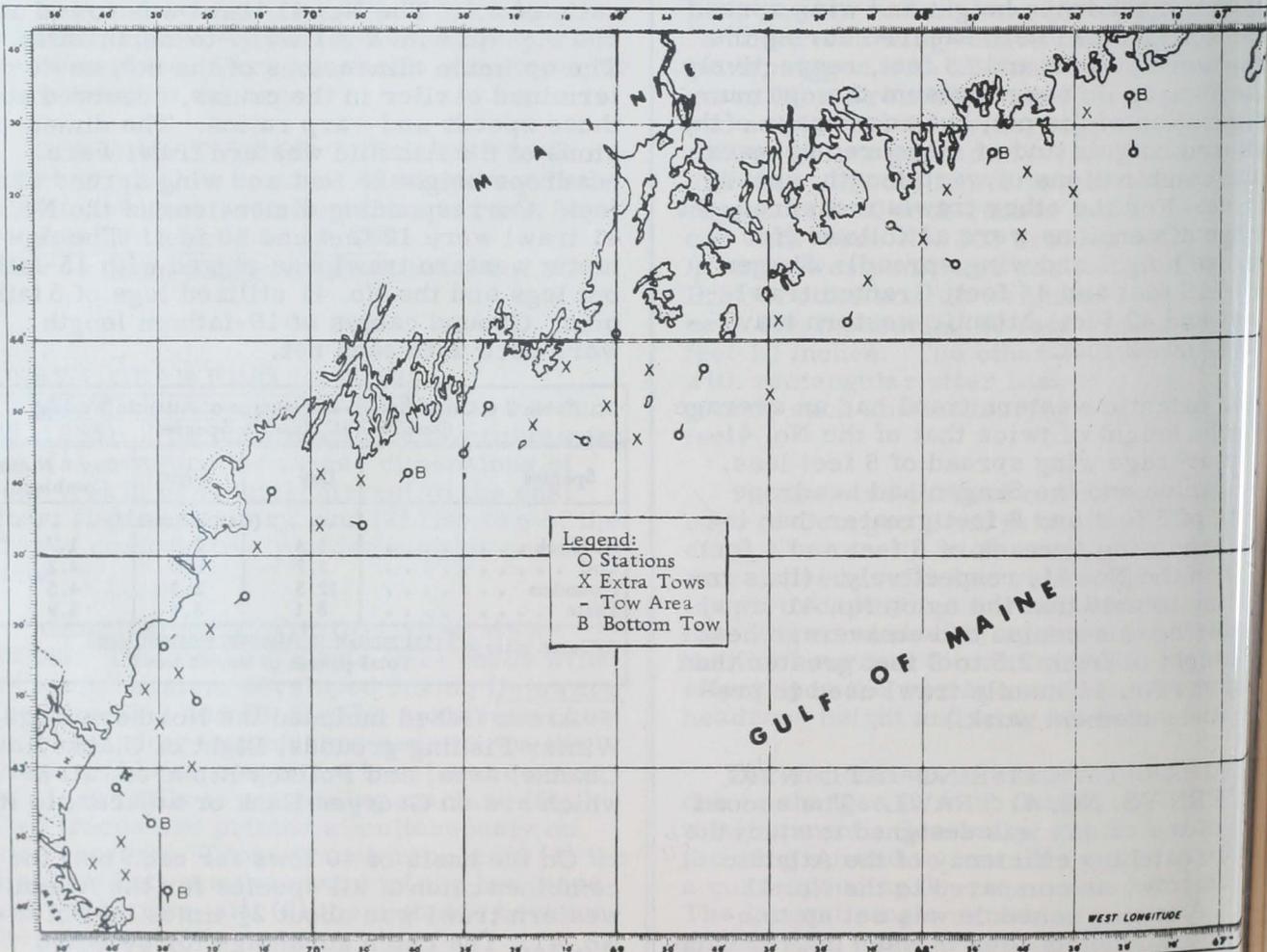
Note: See Commercial Fisheries Review, Nov. 1963 p. 37 and June 1963 p. 37.



North Atlantic Fisheries Investigation

SPRING DISTRIBUTION OF HERRING LARVAE STUDIED:

M/V "Rorqual" Cruise 3-65 (May 11-21, 1965): To determine the spring distribution of herring larvae along the coast of the Gulf of Maine, and to compare the catches of herring larvae at routine sampling stations with those in areas not previously sampled were the objectives of this cruise by the research vessel Rorqual, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Boothbay Harbor, Me. The area investigated was between Grand Manan Channel and Cape Ann.



Shows area of operations during M/V Rorqual cruises 3-65 and 4-65 (May 1965).

BIOLOGICAL OBSERVATIONS: Thirty-minute oblique hauls were made at 21 stations routinely sampled, and at 28 additional stations located between them. Horizontal hauls were made at the surface and at 10 and 20 meters (32.8 and 65.6 feet), and bottom in the Saco Bay area to determine the vertical distribution of herring larvae. Except for 5 stations in the Machias area where the Boothbay Trawler No. 1 trawl was used, samples were collected with the larger Boothbay Trawler No. 2 trawl. A single oblique tow with the Gulf III trawl was made in Grand Man Channel.

The oblique trawl tows yielded 12,407 fish larvae of which over 7,000 were herring larvae. Individual catches of herring larvae varied from 0 at a number of stations near Cape Ann to 1,046 in Saco Bay. Larvae were present at most of the stations sampled, and some of the hauls that were not sampled routinely had good catches. The horizontal tows in the Saco Bay area showed that herring larvae were concentrated from the surface to 10 meters; perhaps fewer than 9 percent of the 904 larvae taken were from 20 meters and from the bottom to 25 meters (147.6 feet). Other fish larvae had a similar distribution and only one-third of the 1,397 taken were from those depths. The size range of herring larvae extended from 20 to 45 millimeters (0.9 to 1.8 inches). The size modes varied between stations but usually were positioned from 30 to 35 meters (98 to 114.8 feet). No herring were recorded on the echo-sounder.

HYDROGRAPHIC OBSERVATIONS: The bathythermograph recorder was run throughout the cruise and surface salinity and temperature was sampled at each station. Five sea-bed drifters and surface drift bottles were released at each station. Nansen bottle and bathythermograph casts were made in Grand Man Channel.

V "Rorqual" Cruise 4-65 (May 21-26, 1965): To sample larval herring and make environmental measurements at selected stations in the coastal areas of the Gulf of Maine was the objective of this cruise by the Rorqual. The area investigated was between Machias and Cape Ann within the 50-fathom line.

BIOLOGICAL OBSERVATIONS: Oblique hauls with the Boothbay Trawl No. 1 were made at 21 stations from 20 meters to the surface at 18 stations and from the bottom to surface at 3 stations in the central-eastern cruise sector. Oblique Gulf III trawl tows were made from 20 meters to the surface at coastal continuity stations.

A total of 140 herring larvae were taken at 15 of the 21 stations in the trawl. As in the Rorqual's previous cruise, no larvae were taken in the vicinity of Cape Ann, and the size range of larvae from other stations was 24-45 millimeters (0.94-0.98 inches). The catch per unit of effort was half that of the previous cruise at stations routinely sampled. Only 13 larvae were taken in the Gulf III trawl. Surface temperatures ranged from 39.8° F. in the Machias Bay area to 55.2° F. at Cape Ann. A thermocline was present in the waters from Cape Ann to Penobscot Bay. No herring were recorded on the echo-sounder.

HYDROGRAPHIC OBSERVATIONS: Nansen bottle casts, bathythermograph casts, and photometer and secchi disc readings were made at each station. Five sea-bed drifters and 5 surface drift bottles were released at each station.

Note: See Commercial Fisheries Review, August 1965 p. 46.

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RECORD DOGFISH CATCH OBTAINED IN SINGLE TOW:

Each groundfish survey cruise conducted by research vessels of the U. S. Bureau of



A big haul of spiny dogfish by a U.S. Bureau of Commercial Fisheries research vessel.

Commercial Fisheries Biological Laboratory, Woods Hole, Mass., occupies around 200 trawl stations. The catches of fish vary in size from a few pounds to 1 or 2 tons. On one of those cruises in April 1965, over 12,000 pounds of dogfish were taken during a single one-half hour tow. That catch, made by the Bureau's research vessel Albatross IV south of Nantucket in a depth of 100 fathoms, was the largest ever made by the vessel, and severely strained Bureau biologists who are responsible for measuring everything that is taken by the net on survey cruises. However, effective subsampling techniques were quickly used to handle the catch. It was noted that no sign of fish had appeared on the fish finder during the tow.



North Pacific Fisheries Explorations and Gear Development

HAKE POPULATION SURVEY CONTINUED:

Simulated commercial fishing for Pacific hake (Merluccius productus) for 100 days is the purpose of cruise 6 by the vessel Western Flyer. Chartered for exploratory fishing by the U. S. Bureau of Commercial Fisheries, the vessel left Seattle July 16, 1965, to fish off the coast of Washington, Oregon, and California.

Major objective of the cruise is to determine the commercial production potential of Pacific hake when fished with the experimental "Cobb" pelagic trawl and accessory equipment. Other objectives include the collection of data such as: (1) economic factors related to commercial exploitations; (2) ruggedness and reliability of experimental gear; (3) catch rates in time and space; (4) analysis of catching technique and fishing methodology; and (5) relative effectiveness of various loading and unloading methods and procedures (splitting, speed brailing, pumping, etc.).

The vessel will operate from a shore-based reduction plant. Nearby hake schools (located during prior explorations) will be fished to determine sustained production capability. Catches will be delivered to a commercial fish reduction plant when possible.

The gear to be used during the production trials include: (1) experimental "Cobb" pe-

lagic trawls; (2) aluminum hydrofoil-type otter boards; (3) electrical towing cable; (4) dual electrical depth-telemetry system; and (5) high-resolution "white-line" type echosounder.

Note: See Commercial Fisheries Review, August 1965 p. 47.



Oceanography

COAST GUARD CUTTER "NORTHWIND" TO STUDY NORTHERN WATERS:

The U. S. Coast Guard cutter Northwind left New York City on June 27, 1965, for a five-months oceanographic study to expand world knowledge of far northern waters. A good part of the expedition will be in northern waters which are relatively unexplored with marine studies scheduled in the Kara and Barents Seas north of Russia. It is expected that the expedition will supply extensive data about those important, but little known waters.



U. S. Coast Guard cutter (269 feet long) Northwind.

Marine scientists of the Coast Guard's Oceanographic Unit will carry out a variety of programs dealing with physical oceanography, geology, and geophysics, hydroacoustics, ice reconnaissance, and biology. To monitor boundary conditions affecting the circulation between the North Atlantic Ocean and the Arctic Basin, the marine researchers will carry out a physical oceanographic survey from the southern tip of Greenland to Iceland, and then on to Scotland. The scientists will occupy 23 stations and their measurements will include temperature, salinity, dissolved oxygen, and water color and transparency determinations.

Working closely with the cutter Northwind, and carrying out similar programs in the Arctic Seas will be scientists of the U. S. Naval Oceanographic Office, the University of Wisconsin, the Office of Naval Research, and the Smithsonian Institution.

This multipronged investigation of far northern waters should yield a profile of the seas studied never before available to the world's oceanographic community. As a result of the study, scientists for the first time will have important information on the nature, structure, and history of the immense Eurasian Continental Shelf. The study could shed new light upon the origin of the earth itself. Representative biological life also will be collected on the expedition.

PROPOSED "SEA-GRANT" COLLEGES TO BE DISCUSSED AT UNIVERSITY OF RHODE ISLAND CONFERENCE, OCTOBER 28-29, 1965:

A national conference to develop plans and ideas for implementing the concept of "sea-grant" colleges will be held at the University of Rhode Island on October 28 and 29, 1965. The 2-day session will be held in conjunction with a meeting of the National Academy of Sciences Committee on Oceanography.

Among the featured speakers will be the director of the Institute of Technology, University of Minnesota, who is credited with originating the idea. He believes that "sea-grant" colleges should be established in existing universities as "modernized parallels of the developments in agriculture and the mechanics which were occasioned by the land grant about a hundred years ago. . . . The kind of imagination and foresight could be applied to exploitation of the sea."

Under the Morrill Land Grant Act of 1862, the States were allocated Federal land to establish a college where the "leading object shall be . . . to teach such branches of knowledge of learning as are related to agriculture and the mechanic arts . . ." While Federal lands are not available today for such a purpose, it was suggested, for instance, that use of the funds the U. S. Government receives from the lease of undersea lands might be allocated to "sea-grant" colleges.

Also participating in the meeting on "sea-grant" colleges will be Senator Claiborne Pell

of Rhode Island who said he intends "within a short time" to introduce legislation concerning "sea-grant" colleges. Other educators, scientists, and Congressmen will be invited to take part in the sessions. (University of Rhode Island, Kingston, R. I., July 15, 1965.)



Salmon

U. S. PACIFIC COAST CANNED STOCKS, JULY 1, 1965:

On July 1, 1965, canners' stocks (sold and unsold) in the United States of Pacific canned salmon totaled 733,575 standard cases (48 1-lb. cans)--218,069 cases less than on June 1, 1965, when stocks were 199,236 cases less than on May 1, 1965.

On the basis of a total of 858,116 actual cases (consisting of cans of 1/4-lb., 1/2-lb., 1-lb., etc.), pink salmon accounted for 46.5 percent (399,169 cases of which 326,096 cases were 1-lb. talls) of the total canners' stocks on July 1, 1965. Next came chum (262,259 cases, mostly 1-lb. talls), followed by red (109,129 cases). The remainder of about 10.2 percent was coho (silver) and king salmon.

Species	July 1, 1965	June 1, 1965	May 1, 1965
.(No. of Actual Cases).			
King	24,850	30,336	39,645
Red	109,129	180,128	227,847
Coho	62,709	73,724	87,255
Pink	399,169	515,796	654,421
Chum	262,259	331,956	373,892
Total	858,116	1,131,940	1,383,060

Carryover stocks at the canners' level totaled 1,175,588 standard cases on July 1, 1964, the approximate opening date of the Pacific salmon packing season. Adding the 1964 new season pack of 3,922,356 standard cases brought the total available supply for the 1964/65 season to 5,097,944 standard cases.

Shipments during June 1965 totaled 218,069 standard cases. Shipments at the canners' level of all salmon species during sales year from July 1, 1964, to July 1, 1965, totaled 4,364,369 standard cases. That resulted in a carryover of 733,575 standard cases on July 1, 1965, the beginning of the 1965/66 sales year, substantially lower (37.6 percent) than the 1,175,588 cases a year earlier.

Table 2 - Total Cannery Stocks on Hand July 1, 1965 (Sold and Unsold), By Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
..... (Actual Cases)						
48 1/4-lb.	1,749	33,200	8,782	1,115	22	44,868
48 1/2-lb.	20,159	58,909	12,668	68,304	21,741	181,781
48 1-lb.	2,856	17,009	39,786	326,096	231,483	617,230
12 4-lb.	86	11	1,473	3,654	9,013	14,237
Total	24,850	109,129	62,709	399,169	262,259	858,116

Table 3 - Cannery Shipments From July 1, 1964 to July 1, 1965, By Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
..... (Actual Cases)						
48 1/4-lb.	22,498	394,732	113,910	10,566	1,422	543,128
48 1/2-lb.	116,683	628,185	41,707	535,164	136,350	1,458,089
48 1-lb.	19,265	481,045	128,723	2,071,828	647,124	3,347,985
12 4-lb.	330	4,939	20,017	95,743	30,529	151,558
Total	158,776	1,508,901	304,357	2,713,301	815,425	5,500,760

The new 1965 season Alaska salmon pack totaled 2,219,299 standard cases (includes 171,859 cases of pink salmon) as of July 25, 1965. That compared with 1,585,951 cases on July 26, 1964. Most of the new pack consisted of red salmon packed at canneries in central and western Alaska.

Data on canned salmon stocks are based on reports from U. S. Pacific Coast canners who packed over 96 percent of the 1964 salmon pack. (Division of Statistics and Economics, National Cannery Association, July 26, 1965.)

Based on data submitted to the U. S. Bureau of the Census by a sample of wholesalers and warehouses of retail multiunit organizations, distributors stocks of salmon were estimated at 584,000 actual cases on July 1, 1965, and 671,000 actual cases on June 1, 1965. Data on distributors stocks for previous months are not available.



Shrimp

BREADED PRODUCTION, JANUARY-MARCH 1965:

United States production of breaded shrimp during the first quarter of 1965 amounted to about 21.3 million pounds -- a decrease of about 1.4 million pounds or 6.1 percent as compared with the same period in 1964.

Table 1-U. S. Production of Breaded Shrimp by Months, 1964-65

Month	1/1965	1964
..... (1,000 Lbs.)		
January	6,901	7,347
February	6,613	8,045
March	7,742	7,249
April	-	7,027
May	-	6,171
June	-	6,588
July	-	8,641
August	-	7,299
September	-	7,830
October	-	9,169
November	-	7,852
December	-	7,460
Total	-	90,678
1/Preliminary.		

Table 2 - U. S. Production of Breaded Shrimp by Areas, January-March 1965

Area	1/Jan.-Mar. 1965		Jan.-Mar. 1964	
	No. of Plants	Quantity 1,000 Lbs.	No. of Plants	Quantity 1,000 Lbs.
Atlantic	17	7,167	14	6,415
Gulf	18	12,420	19	14,407
Pacific	7	1,669	8	1,818
Total	42	21,256	41	22,641
1/Preliminary.				

The Gulf States ranked first in the production of breaded shrimp with 12.4 million pounds, followed by the Atlantic States with 7.2 million pounds, and the Pacific States with 1.7 million pounds.

Note: See graph on p. 23 of this issue; also *Commercial Fisheries Review*, May 1965 p. 36, Jan. 1965 p. 47.



South Atlantic Fisheries Explorations and Gear Development

FISHERY RESOURCE POTENTIALS IN SOUTHERN BAHAMA AREA EXPLORED:

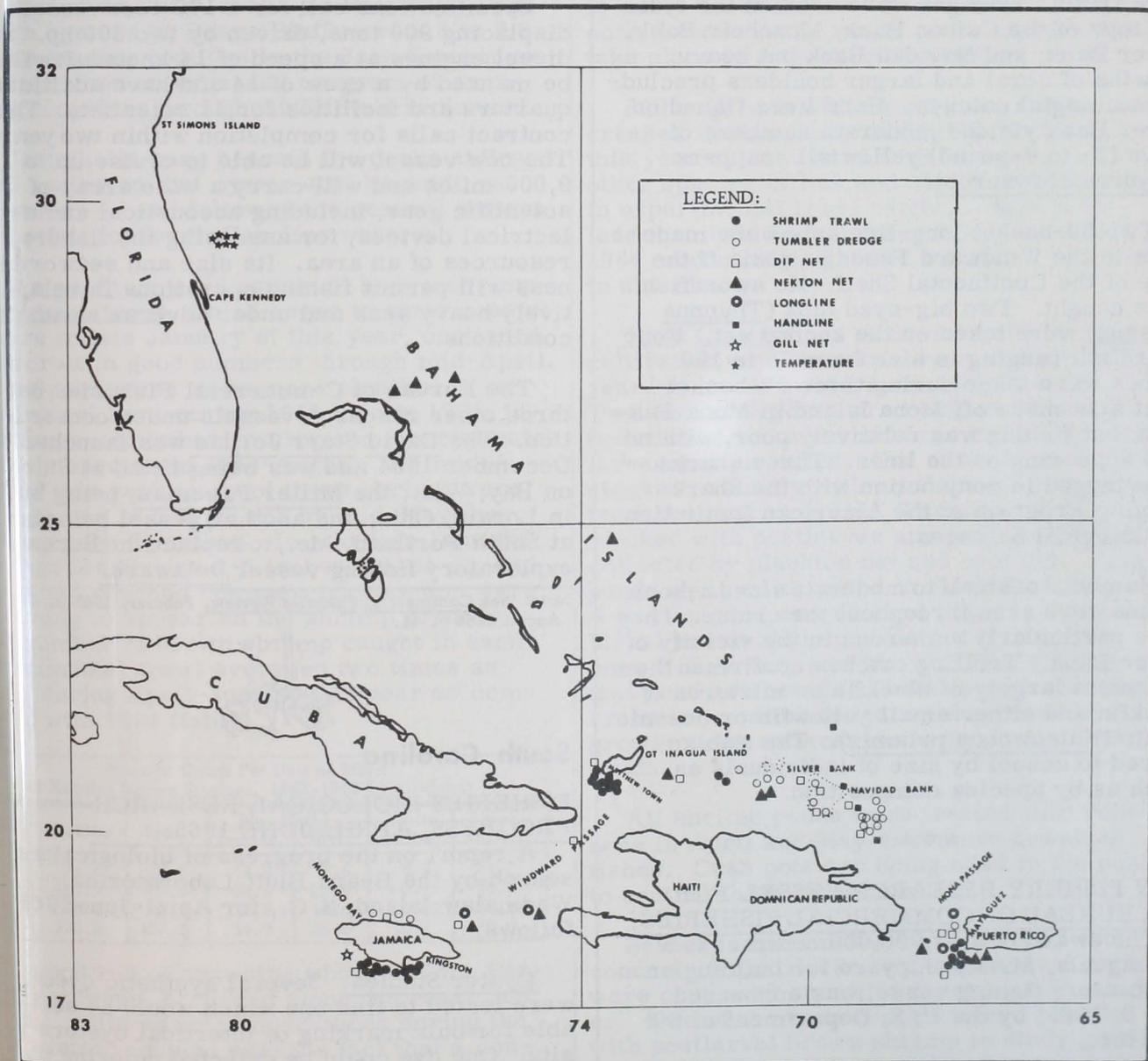
M/V "Oregon" Cruise 101 (May 10-June 17, 1965): A 40-day cruise in the southern Bahamas, Windward and Mona Passages, and along the southwest, west, and north coasts of Jamaica was completed June 18, 1965, by the exploratory fishing vessel Oregon of the U. S. Bureau of Commercial Fisheries.

Purposes of the cruise were to: (1) obtain general preliminary idea of the resource

potentials of the little known areas traversed as a part of the overall explorations of the western Atlantic, and (2) cooperate with the United Nations Special Fund Caribbean Program in providing at-sea training to observers from Jamaica and Puerto Rico.

In addition to using trawls, dredges, and long lines, a wide variety of types of gear was used on the cruise to gain a general impression of the relative richness of the fauna, including trolling lines, neuston nets, nekton nets, dip nets, gill nets, and hand lines.

Trawling was made difficult--and in many areas impossible--by the extremely rugged



Shows area of operations during M/V Oregon cruise 101 (May 10-June 17, 1965):

nature of the bottom topography. Only in a few selected areas could trawls be used. Trawling close inshore along the southwest coast of Jamaica yielded moderate catches of small lane snapper (Lutjanus synagris) and very small numbers of pink shrimp (Penaeus duorarum). The sea bottom was smooth, and the only difficulty encountered was with "grass" clogging the net.

Trawling in a depth range of 225-360 fathoms south of Great Inagua Island yielded up to 30 pounds per 30 minutes per 40-foot shrimp trawl of the deep-water queensnapper (Etelis oculatus). Elsewhere the bottom proved to be largely corallaceous--catches were insignificant and gear damage resulted from trials. Dredges were used on the sides and tops of the Caicos Bank, Mouchoir Bank, Silver Bank, and Navidad Bank but heavy growths of coral and larger boulders precluded meaningful catches. Hand lines fished on Silver Bank yielded moderate numbers of large (3- to 4-pound) yellowtail snappers (Ocyurus chrysurus).

Two 50-basket long-line sets were made at night in the Windward Passage, just off the edge of the Continental Shelf. No swordfish were caught. Two big-eyed tuna (Thunnus obesus) were taken on the second set. Four swordfish ranging in size from 75 to 150 pounds were taken during three 50-basket night sets made off Mona Island in Mona Passage, but fishing was relatively poor, with no tuna appearing on the lines. Three sharks were tagged in conjunction with the Shark Tagging Program of the American Institution of Biological Sciences.

Numbers of small to moderate sized schools of tuna were seen throughout the cruise. They were particularly numerous in the vicinity of Silver Bank. Trolling catches confirmed them to consist largely of blackfin or mixtures of blackfin and either small yellowfin or oceanic bonito (Katsuwonus pelamis). The fish appeared to school by size of individuals as much as by species composition.

* * * * *

NEW FISHERY RESEARCH VESSEL FOR U. S. BUREAU OF COMMERCIAL FISHERIES:

The award of a \$1,990,000 contract to a Pascagoula, Miss., shipyard for building an exploratory fishing vessel was announced July 8, 1965, by the U. S. Department of the Interior.

The new vessel will be assigned to the Department's Bureau of Commercial Fisheries Exploratory Fishing Base in Pascagoula. The vessel is designed especially for operation in tropical waters and will play an important part in the Bureau's Tropical Atlantic Oceanography Program. This program is international in scope, involving the cooperative efforts of many countries, and requires the best vessels, equipment, and considerable diversity of scientific skills.

Primary function of the vessel will be to determine the distribution and abundance of the many fish and shellfish resources of the Gulf of Mexico and the Caribbean.

Specifications call for a 170-foot vessel displacing 906 tons, driven by two 800-hp. diesel engines at a speed of 14 knots. It will be manned by a crew of 14 and have additional quarters and facilities for 11 scientists. The contract calls for completion within two years. The new vessel will be able to cruise up to 9,000 miles and will carry a wide array of scientific gear, including accoustical and electrical devices, for assessing the fishery resources of an area. Its size and seaworthiness will permit fishing operations in relatively heavy seas and under adverse weather conditions.

The Bureau of Commercial Fisheries has three other research vessels under construction. The David Starr Jordan was launched in December 1964 and was being fitted at Sturgeon Bay, Wis.; the Miller Freeman, being built in Lorain, Ohio; and another vessel being built at South Portland, Me., to replace the Bureau's exploratory fishing vessel Delaware.

Note: See Commercial Fisheries Review, February 1965 p. 45; August 1964 p. 44.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, APRIL-JUNE 1965:

A report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for April-June 1965 follows:

Oyster Studies: Several synthetic dyes were tested to find one which would be suitable for bulk marking of intertidal oysters in situ. One dye could be detected coloring the

shells of oysters for 14 days in shallow areas. However, where the oysters were exposed to wave action retention time was reduced considerably and marking of oysters thus was impractical. This study will continue in hopes of finding a long-lasting marker which can be sprayed on intertidal oysters growing on the beds.

Studies on the general condition of oysters in several areas in the State were continued. Measurements to show the relationship between the internal volume of the oyster shell and the weight of the meat of the oyster were used to determine the condition factor. Fluctuations throughout the State were great, ranging from a low of 3.1 near Charleston Harbor to a high of 12.5 in Bull Bay. Pond-grown oysters at Bears Bluff were 9.8 to 9.9. These studies continue in the July-September quarter when an expanded program of sampling of oysters throughout the State is planned.

Test shells hung beneath the docks at Bears Bluff indicated that oyster spat began to set about May 19 and followed the general pattern of spatfall for South Carolina waters.

Shrimp Studies: Postlarval brown shrimp, *Penaeus aztecus*, which began to enter coastal waters in late January of this year, continued to recruit in good numbers through mid-April. The postlarvae were more plentiful in experimental tows during 1965 than in 1964, indicating a somewhat greater commercial catch of this species in June-August. By mid-April of this year many of those shrimp were 1 1/2 inches in length, and by mid-May they averaged 2 1/2 - 3 1/2 inches. In mid-late June the average length was 4-5 inches, heads on, and many had reached commercial size and were beginning to appear on the shrimp grounds. The number of brown shrimp caught in each experimental trawl averaged two times as many during April-June of this year as compared with 1964 (table).

	Croaker	Spot	Blue Crabs		White Shrimp	Brown Shrimp
			Immat.	Mat.		
1962	71.4	25.8	13.9	9.5	8.3	21.7
1963	151.9	65.6	15.6	29.3	-0.1	10.8
1964	146.8	42.9	12.9	18.6	0.02	34.2
1965	176.9	107.6	14.9	25.0	16.7	92.9

good run of spawning white shrimp, *Penaeus setiferus*, occurred along the coast this spring. Mild water temperatures during the winter, coupled with the fact that a con-

siderable population of white shrimp wintered over in coastal waters, probably was responsible to a great extent for the roe shrimp success this year. The majority of white "roe" shrimp appeared to spawn in early and mid-May, and postlarval white shrimp began to show up in plankton tows in mid-May. These small shrimp were extremely abundant during late May and early June. To date, the postlarvae have been over ten times more numerous than during the same period in 1964, and the outlook for the commercial catch of white shrimp this year is greatly improved. By late June, postlarval white shrimp entering inside waters began to decline in numbers, but a second peak of abundance may occur in July. Whether this occurs or not, the outlook is many times improved over 1963-64, and a considerable early run of white shrimp should take place in August or September.

Although both white and brown shrimp increased in abundance during April-June of this year as compared with last year, many other species of fish and shellfish declined in experimental trawl catches. Spot were less than half as numerous this year as in 1964, and croaker showed a similar decrease in abundance.

Pond Cultivation: A number of shrimp cultivation experiments, begun earlier this year, were continued during this quarter. Two one-acre ponds are being stocked with both brown and white shrimp, including postlarvae and juveniles. One of those ponds was stocked naturally with postlarvae by flooding from the nearby creek. The other pond was stocked with postlarvae and juvenile shrimp collected by plankton net and cast net. Both ponds will be harvested in the fall of the year. A 1/10-acre pond was stocked entirely with postlarval brown shrimp collected by plankton nets in February and March. The shrimp in that pond are being fed heavily with chopped crabs in an effort to learn more about shrimp growth rates and maximum productivity of ponds.

All shrimp ponds were treated with rotenone in April and May to remove unwanted fishes. Crab pots are being used in the ponds to control those predators.

Several experiments, using 12 x 12 foot concrete tanks stocked with postlarval shrimp, were continued or initiated during this quarter. Two of the tanks were stocked heavily with postlarval brown shrimp to study growth

rates in controlled conditions. One tank has been stocked with plankton collections containing white shrimp postlarvae as well as many blue crab (*Callinectes sapidus*) larvae. The purpose of this experiment is to determine whether crab larvae can survive pond conditions, and if so what effects they have on young shrimp.

Experiments on artificial breeding of white shrimp were carried out during May and June. Several white "roe" shrimp in spawning condition were induced to spawn in tanks, and in one case a number of eggs were hatched. Although the young shrimp survived only a few hours after hatching in this experiment, the results were encouraging.

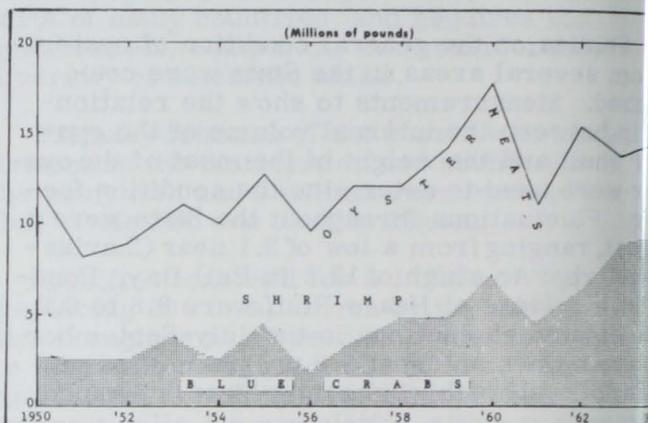
Fish Kill: Beginning May 21, 1965, another fish kill occurred in the Ashley River. It was first reported to Bears Bluff Laboratories by National Park Service personnel who noticed and collected dead and dying mullet around Fort Sumter in Charleston Harbor. Although most of the dead fish noted in the river were menhaden, inspectors of the State's Division of Commercial Fisheries also found spot, mullet, and 1 or 2 shrimp. The kill was investigated by the S. C. Water Pollution Control Authority. It continued sporadically through the end of June. In June, the U. S. Public Health Service sent in a team of investigators from Cincinnati, Ohio, and another from Athens, Ga. Bears Bluff Laboratories cooperated with them in every way and the research boat *Anita* was used to collect fish. Two trips were made to areas far removed from the Ashley River to secure control specimens, and two trips were made in the Ashley River where repeated trawling produced a large number of abnormal-appearing discolored menhaden and croaker, which were given to the Public Health Service.

* * * * *

FISHERY LANDINGS AND TRENDS, 1964:

Landings of fish and shellfish at South Carolina ports during 1964 were 21.7 million pounds valued at \$3.0 million--a decrease of 1 percent in quantity and 7 percent in value from 1963. Leading species during 1964 were blue crab 9.4 million pounds, spot 3.2 million pounds, shrimp 2.6 million pounds (heads-on), and oyster meats 2.5 million pounds. Those 4 species made up 82 percent of the year's total catch.

Blue crab landings were at a record level for the second straight year. Ex-vessel crab prices ranged from 3 to 5 cents a pound in 1964. With a firm market for crab meat, nearly all picking plants in South Carolina worked to capacity. Crab fishermen tended to shift to the use of pots and traps, rather than trot lines.



South Carolina landings of crabs, shrimp, and oysters, 1950-1964

Shrimp landings were up 20 percent from 1963, but were far below the average catch of 5 to 7 million pounds of recent years. The average ex-vessel price for shrimp in 1964 was 33 cents a pound (heads-on weight), an increase of 4 cents from the previous year.

The production of oyster meats in 1964 totaled 2,511,071 pounds valued at \$996,969 as compared with 3,827,078 pounds valued at \$1,556,451 in 1963.

The catch of food finfish in 1964 was about 5 percent below 1963 due to a poor beach-net fishing season in Horry County during the fall months. Landings were down for flounder, mullet, sea bass, and pompano but up sharply for catfish, spot, and bluefish.

A series of fish kills occurred in South Carolina waters during the year. On May 15 and for several days thereafter, a heavy kill of fiddler crabs and shrimp occurred back of the Isle of Palms. All evidence indicated that the kill resulted from the use of the chemical BHC in a mosquito abatement program. A very large fish kill took place in the Ashley River and Charleston Harbor beginning on the night of June 21. The causative agent in that kill had not been determined at the close of the year. Another fish kill of much smaller magnitude happened in the Ashley River beginning November 18.



States' Legislation

ACTIONS AFFECTING FISHERIES:

Following is a supplemental list of 1965 laws and resolutions passed by the various State Legislatures which have already adjourned for the year. (Information Letter, National Canners Association, July 17, 1965.)

Florida: H. 2143 provides for uniform laws regulating the seafood and fishing industries in Franklin and Wakulla counties.

Puerto Rico: H. 10 annuls the Puerto Rico food, Drug and Cosmetics law of May 1939.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED:

U. S. Fishing Vessels 1/ --Documentations Issued and Cancelled, by Areas, February, March, April, May 1965

Area (home port)	February		March		April		May		January-May	
	1965	1964	1965	1964	1965	1964	1965	1964	1965	1964
..... (Number)										
Added first documents:										
New England	3	1	1	-	4	4	2	7	13	13
Middle Atlantic	2	1	-	-	-	1	2	2	5	5
Chesapeake	-	-	4	4	3	2	3	7	14	18
South Atlantic	5	5	8	6	7	1	4	4	27	21
Gulf	24	20	16	13	35	11	29	31	113	92
Pacific	9	3	18	4	13	16	30	27	76	53
Great Lakes	-	-	1	-	-	-	-	-	1	1
Hawaii	-	-	-	-	-	-	-	-	-	-
Puerto Rico	-	-	-	-	1	-	-	-	1	-
Total	43	30	48	27	63	35	70	78	250	203
Removed from documentation 2/:										
New England	5	5	3	2	6	3	3	3	18	14
Middle Atlantic	3	1	6	2	-	4	1	-	11	9
Chesapeake	4	5	1	1	2	2	6	4	14	16
South Atlantic	8	6	6	5	11	4	9	1	41	20
Gulf	10	11	13	8	8	13	3	6	40	47
Pacific	3	8	10	20	8	19	8	15	37	69
Great Lakes	1	-	4	1	1	2	-	1	8	9
Hawaii	-	-	-	-	-	-	1	-	2	-
Total	34	36	43	39	36	47	31	30	171	184

1/ Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/ 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.

Maine: H. 94 relates to the license for sardine packers. H. 95 repeals the law regarding the canning of herring. H. 848 repeals the sardine tax on exports. S. 293 repeals the Fish Packing Wage Board Law. H. 226 revises the minimum wage law.

North Carolina: H. 560 rewrites the laws relating to the conservation of marine and wildlife resources. H. 862 authorizes the State board of health to make and enforce regulations concerning the sanitary aspects of harvesting, processing, and handling shellfish and crustacea, including the power to issue and revoke permits.

New York: A. 4320 requires that the State sanitary code shall prescribe procedures for testing of the atmosphere, potable waters, activated soil, plant and animal life grown and raised for food, and all food and food products, to determine the level of radioactivity.



U.S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-July 3, 1965, amounted to 19,159,835 pounds (about 912,400 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. That was a gain of 7.7 percent from the 17,793,706 pounds (about 847,300 standard cases) imported during January 1-July 4, 1964.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the 12½-percent rate of duty is limited to 66,059,400 pounds (or about 3,145,685 standard cases

of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

AIRBORNE IMPORTS OF FISHERY PRODUCTS, JANUARY-MARCH 1965:

Airborne imports of fishery products into the United States in January-March 1965 to-

Product and Origin ²	Jan.-Mar. 1965		Jan.-Mar. 1964	
	Qty. 3/	Value 4/	Qty. 3/	Value 4/
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000
Fish:				
All countries	230.6	230.2	108.1	41.4
Shrimps:				
Venezuela	4,546.5	2,325.0	1,138.0	466.6
Panama	369.6	225.1	249.6	145.2
Costa Rica	28.9	14.6	139.9	77.8
El Salvador	17.4	13.1	87.1	50.9
Colombia	54.1	29.8	-	-
Nicaragua	-	-	6.6	4.1
Total shrimp	5,016.5	2,607.6	1,621.2	744.6
Shellfish other than shrimp:				
Canada	0.6	0.4	1.2	0.9
Mexico	0.4	0.3	9.0	4.8
British Honduras	54.5	52.0	67.6	47.0
Honduras	10.2	4.4	8.4	8.6
Nicaragua	70.7	94.0	40.2	30.9
Costa Rica	13.9	13.3	9.3	9.5
Jamaica	9.5	15.9	32.0	26.2
Other countries	95.6	65.7	18.3	6.2
Total shellfish (except shrimp)	255.4	246.0	186.0	134.1
Grand total	5,502.5	3,083.8	1,915.3	920.1

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 overall import figures for total imports, i.e., these imports are not to be added to other import data published.

Source: United States Exports & Imports by Air, FT 785, January, February, and March 1965, U.S. Bureau of the Census.

taled 5.5 million pounds with a value of \$3.1 million. That was more than double the airborne fishery imports in the first quarter of 1964. The increase was due mainly to larger shipments of shrimp from Venezuela. The imports of shrimp from Venezuela accounted for 83 percent of total airborne fishery imports in January-March 1965.

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.

IMPORTS OF FROZEN FISH BLOCKS OR SLABS, 1959-64:

United States imports of frozen fish blocks or slabs (for manufacturing fish sticks and portions) have increased steadily each year since 1959. In 1964, those imports were up 8 percent in quantity and 18 percent in value from the previous year.

The 1964 imports of frozen fish blocks or slabs were nearly double the quantity imported in 1959 and the value was more than double. Despite the greatly increased imports over the past five years, fish blocks have recently been in very short supply. The demand for fish sticks, and particularly fish portions for the institutional trade, has increased greatly and United States producers have been hard pressed for supplies of the raw material. During 1965 the fish block shortage has been termed almost acute and producers of fish sticks and portions were searching for new sources of raw supplies.

Canada has ranked since 1959 as the principal supplier of frozen fish blocks to the

United States Imports of Fish Blocks or Slabs by Country, 1959-1964

Country	1964		1963		1962		1961		1960		1959	
	1,000 Lbs.	Value \$1,000										
Greenland	6,659	1,360	8,034	1,622	6,264	1,260	3,841	774	3,853	773	1,203	244
Canada	98,681	22,417	75,746	15,374	76,101	15,162	68,461	14,294	55,266	11,313	43,167	8,611
Miquelon	641	145	451	95	630	128	420	84	885	177	200	44
Iceland	39,268	8,988	31,781	7,011	28,415	5,547	26,714	5,651	17,912	3,925	16,366	3,211
Norway	9,203	1,898	17,462	3,578	17,737	3,637	7,807	1,640	3,445	690	12,530	2,503
Denmark	4,702	1,007	12,001	2,399	9,253	1,854	8,491	1,700	6,083	1,209	10,171	2,031
United Kingdom	-	-	520	101	43	8	-	-	88	19	89	11
Netherlands	-	-	-	-	-	-	51	15	-	-	62	2
West Germany	2,731	490	4,289	779	3,145	570	1,953	375	1,870	368	1,400	271
Japan	2,030	473	155	36	35	6	110	24	14	3	102	11
South Africa Republic	2,247	321	2,832	393	1,918	264	760	103	256	38	-	-
Other	4	1	-	-	-	-	1	1/	-	-	-	-
Total	166,166	37,100	153,271	31,388	143,541	28,436	118,609	24,660	89,672	18,515	85,290	17,011

1/ Less than \$1,000.

Source: United States Imports of Merchandise for Consumption, FT-110, Bureau of the Census.

United States market and in 1964 accounted for 59 percent of the total imports of that product. Iceland has been the second important supplier of frozen fish blocks, followed by Norway, Greenland, Iceland, Denmark, and West Germany.



Virginia

RESULTS OF RESEARCH DISCUSSED AT NATIONAL SHELLFISH ASSOCIATION MEETING:

The seasonal behavior of MSX in destroying oysters in Virginia was described by the Senior Marine Scientist of the Virginia Institute of Marine Science to the assembled oyster biologists from the entire coastal area of the United States at their annual National Shellfisheries Association meeting in Baltimore, Md., in June 1965.

Along with a thumbnail sketch of periods when mortalities of oysters are most likely to occur, he presented a graph showing the absence of infections and death rates in disease-free oysters imported from November to June into MSX-infested areas. Some 40 percent of the seed oysters planted in such areas will die before winter and as high as 90 percent will be dead at the end of three years, according to the Institute scientist. He pointed out that on the other hand, if seed oysters are planted in MSX-infested waters after August 1, they become infected but deaths do not occur until the following June. The short-term storage or holding of oysters is possible in MSX-infested areas.

Institute scientists said that in summer 1964, large numbers of offspring from brood oysters which had survived several years in MSX-infested water were successfully raised to seed size--about 2 inches. That seed will be exposed to MSX for several years to eliminate susceptible oysters. The survivors will become parents of the next generation and should exhibit considerable resistance to MSX.

Papers presented by Institute scientists at the meeting included one on two clams found in marine waters, "*Larval Development of Angia cuneata and Lyonsia hyalina"; others were "Salinity Tolerance Limits of Some Species of Pelecypods from Virginia"; and a program in Virginia for Breeding MSX*

Resistant Oysters by Hatchery and Pond Methods," given at a joint session of oyster biologists and oyster growers. (Virginia Institute of Marine Science, Gloucester Point, June 29, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 43; September 1964 p. 36.



Wholesale Prices

EDIBLE FISH AND SHELLFISH, JULY 1965:

Because prices for fresh finfish generally increased from June to July 1965, the wholesale index for edible fishery products (fresh, frozen, and canned) at 109.8 percent of the 1957-59 average rose 0.8 percent. Compared with July 1964, the overall index this July was up 3.0 percent because of higher prices for nearly all items. July 1965 prices were substantially higher than a year earlier for many fresh and frozen fishery products and some canned fish products in short supply.

The subgroup index for drawn, dressed, or whole finfish was up 5.0 percent from June to July because of higher prices for nearly all items. At New York City, wholesale prices were up for western fresh halibut by 14.3 percent as a result of light supplies; western fresh king salmon by 3.6 percent; and Great Lakes round yellow pike by 13.5 percent. At Boston, ex-vessel large haddock prices were up 3.6 percent. But Lake Superior whitefish prices at Chicago were down 4.9 percent. As compared with July 1964, the subgroup index this July was higher by 3.6 percent. Except for salmon, prices were up from a year earlier for all items--25.0 percent for fresh halibut, 3.2 percent for ex-vessel haddock, 22.5 percent for Great Lakes yellow pike, and 11.5 percent for whitefish.

Although July 1965 prices for fresh haddock fillets at Boston were up 12.8 percent from the previous month, they were offset by a price drop (down 3.4 percent) at New York City for South Atlantic fresh shrimp. This brought the fresh processed subgroup index down 0.9 percent. July 1965 prices for shucked standard oysters were unchanged for the 3-month period since May. Compared with July 1964, the subgroup index this July was up 2.9 percent. Prices were higher for all items, but the greatest increase was for haddock fillets (up 16.0 percent).

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, July 1965 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			July 1965	June 1965	July 1965	June 1965	May 1965	July 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					109.8	108.9	109.2	106.6
Fresh & Frozen Fishery Products:					112.8	111.5	112.9	109.3
Drawn, Dressed, or Whole Finfish:					119.0	113.3	106.1	114.9
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.12	.11	91.4	88.2	74.0	88.6
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.50	.44	147.9	129.4	119.8	118.3
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.90	.87	125.8	121.4	115.3	129.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.59	.62	87.3	91.8	86.6	78.3
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.63	.55	102.3	90.1	106.4	83.5
Processed, Fresh (Fish & Shellfish):					108.6	109.6	118.9	105.5
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.40	.36	97.2	86.2	80.2	83.8
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.86	.89	100.8	104.3	123.0	98.4
Oysters, shucked, standards	Norfolk	gal.	7.13	7.13	120.2	120.2	120.2	118.0
Processed, Frozen (Fish & Shellfish):					105.7	106.6	109.4	102.5
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	97.6	98.8	98.8	95.0
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.37	108.5	108.5	109.9	108.5
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.32	.30	112.2	105.2	105.2	108.7
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.88	.89	103.7	105.5	109.7	99.0
Canned Fishery Products:					104.9	104.9	103.0	102.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	22.00	22.00	95.9	95.9	91.5	97.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.56	102.6	102.6	102.6	102.1
Mackerel, jack, Calif., No.1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.13	7.13	120.9	120.9	120.9	105.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.25	10.25	131.5	131.5	131.5	113.0

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.

The July 1965 subgroup index for processed frozen fish and shellfish was down 0.8 percent from the previous month. While prices for frozen ocean perch fillets rose 6.7 percent, those for frozen shrimp at Chicago dropped 1.7 percent and for other species of frozen fillets were slightly lower or unchanged from a month earlier. But prices this July were mostly higher than in the same month of 1964, with the subgroup index up 3.1 percent.

July 1965 prices for canned fishery products held at the same level as in the previous month. Market conditions for canned fish

items in the subgroup were better than steady with some indication of firming because of the light seasonal pack for some products. The new Maine sardine canning season was off to a slow start but improved toward the end of July when the new pack exceeded that for the same period in 1964. (The total 1964 pack was disappointing, however, and much less than in 1963.) The subgroup index this July was up 2.6 percent from the same month a year earlier. Prices were higher for canned Maine sardines (up 16.4 percent) and California jack mackerel (up 14.2 percent). Canned tuna prices were slightly higher than in July 1964 and those for canned salmon slightly lower.

