



TRENDS AND DEVELOPMENTS

Alaska

FOREIGN FISHING ACTIVITIES OFF ALASKA:

U.S.S.R.: The Soviet trawl fleet in the Gulf of Alaska gradually decreased through October 1964 but began to increase in size again during the latter part of November 1964. In the previous season, the Soviet Gulf of Alaska trawl fishery terminated in mid-October 1963 and did not resume until mid-March 1964. Now the fishery appears to be developing into a year-round operation. Trawling was generally centered about 40 miles off Ocean Cape in the vicinity of Yakutat where about 25 vessels were operating by the end of November 1964. Observations showed the catch to be primarily Pacific ocean perch, with little or no incidental species being taken.

Two Soviet trawlers of a new type were fishing for shrimp during November 1964 in the vicinity of Two Headed Island off Kodiak. That was believed to be the first commercial exploitation of shrimp by the Soviets in the Gulf of Alaska.



One of the smaller Soviet trawlers fishing in the Gulf of Alaska.

Soviet whaling activity had terminated by the first week in November 1964 and all flotillas had returned to their Siberian bases.

Japan: The Japanese shrimp factoryship Chichibu Maru, accompanied by 10 trawlers,

was fishing north of the Pribilof Islands in the Bering Sea during November 1964.

A large new stern trawler, the Aso Maru, which fished for Pacific ocean perch in the western Aleutian area during late 1964 was scheduled to return to Japan about January 1, 1965.

Three large new stern trawlers, the Akebono Maru Nos. 71 and 72 and the Taiyo Maru No. 82 (the latter accompanied by the smaller trawler Choyo Maru) were reported to be operating in the eastern Bering Sea during November 1964.

GEAR-MARKING DEVICES TESTED:

Late in 1964, the U. S. Bureau of Commercial Fisheries research vessel John R. Manning participated in tests of gear-marking devices near Cape Spencer, Alaska. Nine different reflector buoys designed to be used in conjunction with shipboard radar were evaluated. Several buoys were lost or badly damaged in the severe tide, wind, and sea conditions encountered off the Cape. The tests eliminated a number of unsuitable designs and definitely established maximum and minimum ranges for two markers considered suitable for use under ocean conditions. Six sets (12) of the 2 satisfactory markers will be placed aboard king crab vessels in the Kodiak area for further testing and evaluation by the industry.

SHRIMP SURVEY OFF SOUTHEASTERN ALASKA:

A private fisheries firm has authorized a commercial fisherman to do about 4 months' exploratory fishing for shrimp with a 25-foot beam trawl early in 1965. The company apparently wants to locate sources of pink shrimp in southeastern Alaska for machine-processing either at Ketchikan or Waterfall.

A pink shrimp fishery would add needed diversification to that area.

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HERRING FISHERY, 1964:

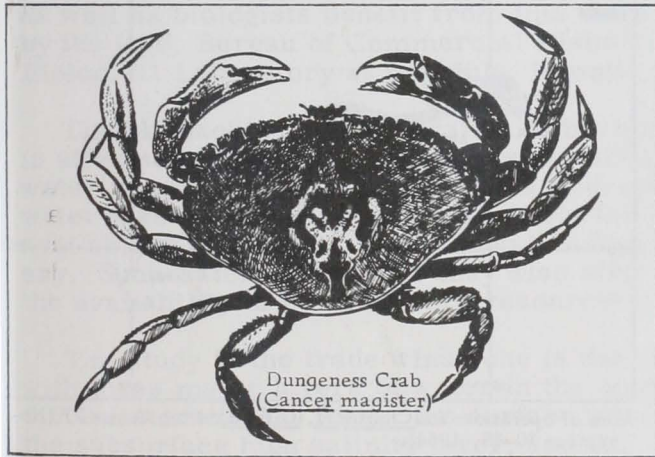
About 22,000 short tons of herring were processed in the 1964 southeastern Alaska summer reduction fishery. Age-composition studies revealed that no strong entering year-class was present and that over 70 percent of the herring were age VI or older.



California

DUNGENESS CRAB CATCH FORECAST, 1964/65 SEASON:

Northern California: A good season for commercial dungeness crab fishermen off northern California has been predicted in 1964/65 by the California Department of Fish and Game. Dungeness crab landings totaling 3.7 million pounds were forecast in northern California ports (Fort Bragg, Humboldt Bay, Trinidad, and Crescent City) during the 1964/65 season, as compared with landings of only 810,000 pounds in the previous season.



The number of legal-size crabs caught in random sampling in areas between false Cape and Crescent City led to the prediction for the 1964/65 season in northern California which opened December 15, 1964. The number of sublegal-size crabs caught (crabs between 6 and 7 inches in breadth) also was good, indicating that the 1965/66 crab fishery off northern California should be comparable to the current season.

Central California: Preseason sampling off central California led to a landings forecast of 750,000 pounds of dungeness crabs for the San Francisco Bay and Bodega Bay area in 1964/65, a substantial decline from the 1.2 million pounds landed in 1963/64. The Bay Area season opened November 10, 1964.

The preseason survey also turned up evidence that the crab fishery in central California probably will not improve in the 1965/66 season. That forecast is based on the small number of sublegal-size crabs caught in the sampling survey.

The preseason surveys were conducted with the California Department of Fish and Game research vessel N. B. Scofield.



Cans--Shipments for Fishery Products

January-October 1964: A total of 2,430,725 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-October 1964, a decrease of 5.8 percent from the 2,579,412 base boxes used during the same period in 1963.



January-September 1964: The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-September 1964 was down about 6 percent from that used during the same period of 1963. During the first 9 months of 1964 there was a decline in the pack of canned Maine sardines on the East Coast, canned shrimp on the Gulf Coast, and canned mackerel on the West Coast. The decline was partly offset by an increase in the Alaska salmon pack. The California canned tuna pack also showed a small increase in the first 9 months of 1964.

In January-September 1964, shipments to the Pacific or Western Area accounted for about 70 percent of total shipments; shipments to the Eastern Area accounted for about 26 percent; and shipments to the Southern Area accounted for most of the remain-

U. S. Domestic Shipments of Metal Cans for Fishery Products, Jan. -Sept. 1963 and 1964^{1/}
(Base Boxes of Metal Consumed in the Manufacture of Cans for Fishery Products)

Receiving Area	First Quarter		Second Quarter		Third Quarter		Jan. -Sept.	
	1964	1963	1964	1963	1964	1963	1964	1963
East ^{2/}	187,707	155,814	173,530	215,924	230,280	276,572	591,517	648,310
Southern	24,761	21,010	28,390	38,197	22,449	34,986	75,600	94,193
North Central	492	29	219	5	194	8	905	42
West ^{3/}	359,947	381,735	574,448	629,376	615,157	594,561	1,549,552	1,605,672
Total	572,907	558,588	776,587	883,502	868,080	906,127	2,217,574	2,348,217

^{1/}Preliminary.
^{2/}Includes Puerto Rico.
^{3/}Includes Alaska and Hawaii.

der. Most of the fish-canning facilities are located in the Pacific Area.

Notes: (1) Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 13,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.5 base boxes per short ton of steel. (In the years 1962 and 1963, tonnage data were based on the factor 21.8 base boxes per short ton of steel.) The use of aluminum cans for packing fishery products is small.

(2) See Commercial Fisheries Review, Jan. 1965 p. 19.



Canned Fishery Products

CANNERS CONVENTION MET IN SAN FRANCISCO, JANUARY 22-27, 1965:

The National Canners Association (NCA) held a Canners Convention in San Francisco, Calif., January 22-27, 1965. The preliminary program of the Convention listed the following events of particular interest to the fishing industry:

NCA-Bureau of Commercial Fisheries Conference (open session).

NCA Technical session #1--Fishery Products Program.

NCA Technical Session #6--Marketing Conference.

A National Exposition for Food Processors was held at Brooks Hall in the Civic Center. Many other events of general interest to canners were also scheduled.



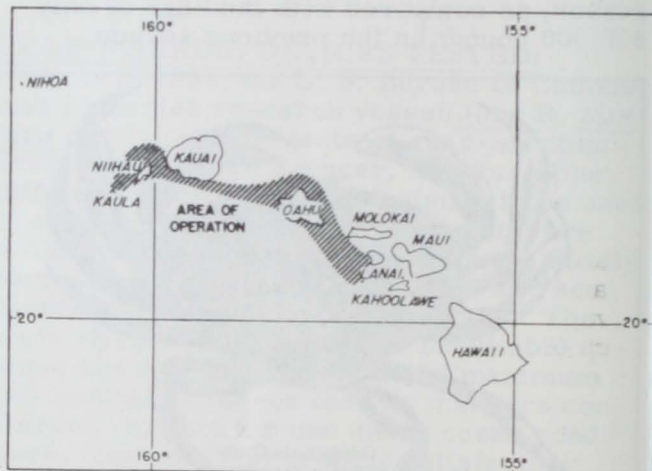
Central Pacific Fisheries Investigations

SKIPJACK TUNA BIOLOGICAL STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 77 (November 10-15, 1964): To collect biological

data on skipjack tuna (aku), which occur in the Hawaiian Islands during the summer and all but disappear during the fall and winter, was the principal objective of this 6-day cruise off the Hawaiian Islands by the research vessel Charles H. Gilbert, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii.

Skipjack tuna populations in the Pacific are divided into a number of reproductively isolated groups called subpopulations. At least two of those groups make up the skipjack catch of the Hawaiian pole-and-line fishing fleet. Those subpopulations can be identified by the blood type of the fish.



Area of operations for Charles H. Gilbert during Cruise 77 (November 10-15, 1964).

During cruise 77, the Charles H. Gilbert took a total of 109 skipjack bloods for population studies from the single school that was successfully fished. The skipjack were taken off the Island of Niihau. Technical difficulties made serum collection impossible.

A total of 87 volume samples of skipjack blood also were collected. The sex of each fish yielding a large volume of blood was determined making a total of 87 skipjack for which blood type and sex can be coordinated.

Twelve snouts and 12 kidney sections of fresh skipjack were collected and preserved for biological study.

The following sightings of bird flocks with fish schools were recorded: skipjack schools 6; unidentified fish 2; bird flock but no signs of fish 3; porpoise 1; and mahimahi 1.

No yellowfin tuna schools were spotted.

Bathythermograph (BT) casts at 270 meters (886 feet) and surface salinity samples were taken every 3 hours when practical and after each successful fishing effort.

Drift cards were released at the time of each BT and at 1-hour intervals along the windward coasts of Oahu and Niihau.

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

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TRADE WIND ZONE
OCEANOGRAPHIC STUDIES CONTINUED:

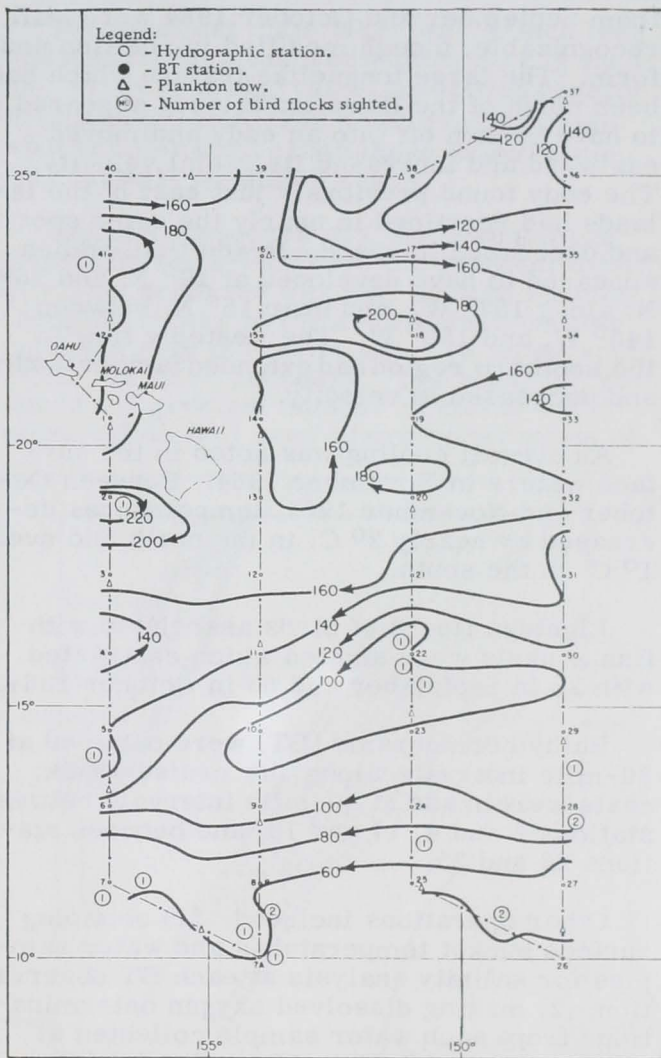
M/V "Townsend Cromwell" Cruise 10 (November 4-24, 1964): This was the ninth in a series of monthly cruises by the research vessel Townsend Cromwell aimed at finding out more about water layers in the trade wind zone of the North Pacific Ocean. Fishermen as well as biologists benefit from this work by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu, Hawaii.

The skipjack catch by Hawaiian fishermen is affected by seasonal movements of surface water types. Similarly, movements of deeper water mass boundaries may also affect the availability of skipjack to the Hawaiian fishery. Such water movements may also affect the availability of other fishery resources.

The study in the trade wind zone is dealing with three major layers of water in the upper 1,500 meters (4,920 feet): the surface water, the subsurface high salinity layer, and the deeper low salinity layer. In low latitudes those 3 water layers may lie within the upper 300 meters (984 feet) of ocean and may be within the upper 150 meters (492 feet) as in the vicinity of latitude 10° N., and therefore are well within the depths where fish are harvested.

Previous studies have shown that the surface-water-type boundary between the high salinity North Pacific Central water and that of the North Pacific Equatorial water moves

seasonally. Data from the present series of cruises confirm the earlier findings. Movements in the boundary of the subsurface high-salinity layer were suspected, but no time-sequence oceanographic data were available to demonstrate such movements. The Townsend Cromwell data now show very pronounced boundary displacements in that layer. Such displacements, although less extensive, are also apparent in the deeper low salinity layer.



Cruise track chart of M/V Townsend Cromwell, Cruise 10 (November 4-24, 1964), showing depth contours of the 20° C. isotherm in meters.

During the November 1964 cruise of the Townsend Cromwell, data were collected in the area bounded by latitudes 10° N. to 27° N. and longitudes 148° W. to 158° W. A total of 43 oceanographic stations were occupied along the cruise track (see chart). At each station temperatures and samples for salinity analysis were obtained at 18 or 20 different depths down to 1,500 meters (4,920 feet).

Deep casts down to 4,000 meters (13,120 feet) to sample 4 other levels were made at stations 7A, 21, 26, 31, and 39. At station 31, an additional sample was taken at 5,000 meters (16,400 feet), but the thermometers were broken by apparent implosion.

The November 1964 surface circulation pattern indicated further change from the summer to the winter pattern. Some features from September and October 1964 were still recognizable, though modified in position and form. The large tonguelike feature which had been north of the Hawaiian Islands appeared to have broken off into an eddy and moved eastward and increased its radial velocity. The eddy found previously just east of the Islands had remained in nearly the same spot and decreased in speed. In addition, eddies appeared to have developed at 19° N. and 16° N. along 157° W., and near 15° N. between 148° W. and 155° W. The westerly flow in the southern region had extended farther north and decreased in velocity.

An overall cooling was noted in the surface waters in November 1964. Between October and November 1964, temperatures decreased by nearly 2° C. in the north and over 1° C. in the south.

Eighteen flocks of birds associated with fish schools were sighted which contrasted with 28 in September and 63 in October 1964.

Bathythermograms (BT) were obtained at 30-mile intervals along the cruise track; casts were made at 10-mile intervals between stations 2 and 4, 17 and 19, and between stations 23 and 25.

Other operations included: (1) obtaining surface bucket temperatures and water samples for salinity analysis at each BT observation; (2) making dissolved oxygen determinations from each water sample collected at stations 7A to 16, 26 to 37, and at 39; (3) taking water samples for dissolved inorganic phosphate analysis; (4) releasing 10 plastic-enclosed drift cards at hourly intervals the first 12 hours and the last 9 hours of the cruise and at 30-mile BT observations throughout the rest of the cruise; (5) making daily plankton tows; and (6) taking radiation measurements from the sun and sky.

These monthly oceanographic cruises in the trade wind zone are a pilot study which is scheduled to continue through June 1965 and

so provide the necessary data to begin analysis of the nature and significance of the water mass movements.

Note: See Commercial Fisheries Review, Jan. 1965 p. 23.



Clams

PROGRESS REPORT OF 1964 SURF CLAM SURVEY OFF ATLANTIC COAST:

A progress report on a surf or sea clam survey made in 1964 off the Atlantic coast, conducted jointly by the Oyster Institute of North America and the U. S. Bureau of Commercial Fisheries, was issued in the fall of 1964 by the Bureau's Regional Office, Gloucester, Mass. The survey was first started in the summer of 1963 and resumed in 1964, with field work completed on September 24, 1964. The work done during 1964 was to determine the commercial clam dredging potential of an area designated as survey area V. Survey operations during 1963 were conducted in areas designated as Areas I and IV (off New Jersey, Delaware, and Maryland).

The results of the 1964 surf clam survey as contained in the progress report follow:

Area V is off the coast of Maryland and Virginia just south of Area IV. The northwest corner lies about 15 miles southeast of Ocean City, Md., at $39^{\circ}09'$ N. latitude and $74^{\circ}49'$ W. longitude; the north boundary follows the 1H4-3050 loran line southeasterly from that point, out to the 25-fathom contour. The east boundary follows that contour line south to the $37^{\circ}10'$ N. latitude, roughly paralleling the west boundary which follows the 1H5-3080 loran line from the $37^{\circ}25'$ to $39^{\circ}09'$ N. latitude. The south boundary lies along the 2450-1H4 loran line between the 25 fathom contour line and the $37^{\circ}10'$ parallel. The size of the area is about 900 square miles; the water depth varies from about 50 to 150 feet. The composition of the bottom varies from very hard sandy types to soft mud and clay.

Survey Procedure: Operations followed the same procedure as those used in areas I and IV which were surveyed during the summer of 1963. All sampling stations within the area were located by loran bearings and spaced so that each station occurred about one mile apart. A 40-inch jet-dredge

of the type presently used by the industry was used for taking samples at each survey station.

The clam sounder rigged with two hydrophones was again attached directly to the dredge for use in sounding for shells between stations. The dredge was towed between stations with the pump shut down and the sounder on; when reaching a sampling area, water was pumped to the jets, and after the blade had dug in, a 5-minute tow was made. The catch was then taken aboard for analysis.

Survey operations were started in the northwest section of the area and expanded to the south and east, until at the end of field work, about 30 percent of the area had been covered. Sampling stations were therefore located in both deep and shallow water sections of the survey area and samples were taken from a variety of different bottom soil types that were present in the surveyed area. The best catches of surf clams were made in bottom soils of gravel or soft sand, in water depths from 85 feet to 120 feet.

Yields and Sizes: The largest yield of surf clams from any one station was 10 bushels, but only 9 tows were made where no clams were taken. Most of those 9 tows were made in the deeper offshore waters where the black quahog made up the bulk of the catch. The

Catch of Surf Clams and Black Quahogs, with Bearing and Depth Recordings, for Those Stations Where the Yield Was One or More Bushels of Surf Clams Per Tow

Station Number	Loran Bearing		Depth of Water (In Feet)	Bushels	
	1 H 4	1 H 5		Surf Clams	Black Quahogs
2-29	2714	3076	90	3.0	0.0
3-15	2882	3072	90	1.1	0.0
4-24	2774	3068	87	2.3	3 1/2
6-14	2894	3060	96	1.2	0.0
6-15	2882	3060	96	1.5	0.0
6-17	2858	3060	102	1.7	0.0
6-22	2798	3060	108	10.0	0.0
7-12	2918	3056	99	1.6	0.0
7-22	2798	3056	84	1.6	0.0
8-16	2870	3052	99	1.4	0.0
8-17	2846	3052	98	2.0	0.0
8-25	2762	3052	90	1.0	0.0
8-36	2630	3052	93	2.3	0.0
9-2	3038	3048	102	1.6	0.0
9-19	2834	3048	102	1.9	1 1/2
10-12	2918	3044	102	1.5	1 1/2
10-14	2894	3044	114	3.6	5 1/2
10-16	2870	3044	105	2.8	7 1/2
10-18	2846	3044	105	1.2	1 1/2

1/Number of black quahogs per tow.

predominant size group found throughout the areas were those in the 5 3/4- to 6 1/2-inch size range. At some of the stations, however, surf clams in the smaller size groups outnumbered

those in the mature classes. Those stations were located in areas close to heavy populations of mature clams. The second predominant size class were those in the 1 1/2 to 2 1/2-inch group; with those clams in between the two ranges occurring in less amounts. Very few clams under 1 inch in length were taken, probably due to the inability of the gear to catch them.

The smallest clam taken was 3/8-inch long and the largest measured a little over 7 1/8 inches. In the area of greatest population density the mature clams taken would average somewhat smaller in size than those taken in the less densely populated areas.

Relative Densities of Clam Populations: Generally the area where the greatest density of clams occurred was that section running from the center of the area's western side northeasterly to a point about 15 miles south of the northern boundary. The tows that produced the greatest number of clams were made within that area where softer types of

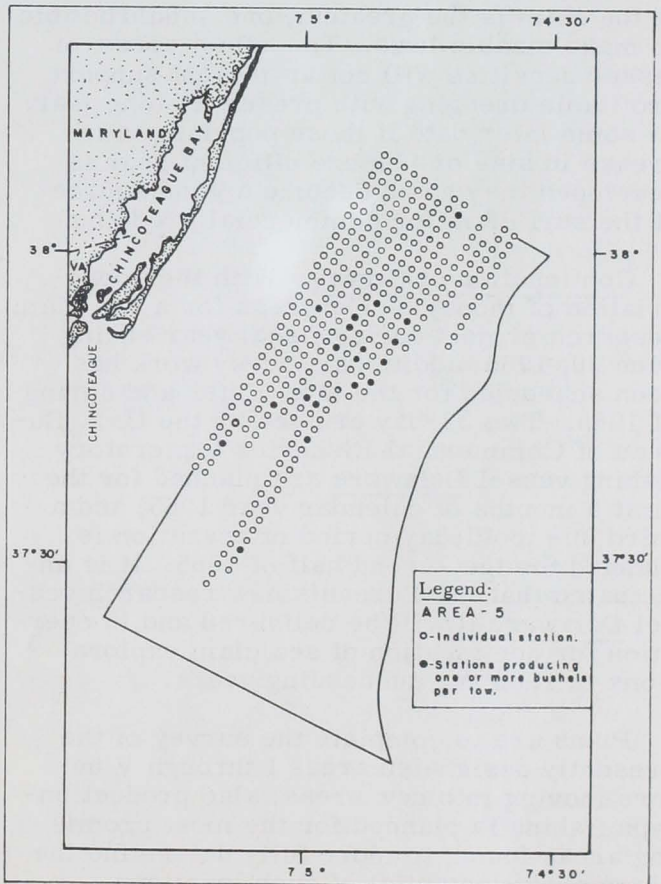


Fig. 1 - Survey Area V showing sampling positions on 1-mile grid pattern. Blacked in stations produced one bushel or more of surf clams in a 5-minute jet-dredge tow.

bottoms were found. North of that the bottom was generally very hard, and south the bottom was very hard with large patches of clay and mud.

Surf clam shells were taken at most of the sampling stations in quantities ranging from 1 or 2 individuals to over 10 bushels.

Very few black quahogs were found along with the surf clams in the best producing clam areas. They did occur in considerable numbers off in the deeper waters where the number of surf clams per tow were few or none at all. The black quahog occurred in those areas in quantities from 3 individuals to a little over 3 bushels. Thus the pattern of distribution appears to be about the same as that found in those areas surveyed in 1963.

The potentiality of that area for future commercial surf clam dredging appears to be the best of any area so far surveyed. There is at present a population of clams of varying density covering almost the entire surveyed area. Within those areas, where the densities of the clam is the greatest, one should be able to make sizable tows. The other areas of lesser densities will not at present support profitable dredging with present fishing gear. At some later date if those populations increase in size or if more efficient gear is developed they could become a good source of the surf clam for commercial dredging.

Continuation of Survey: With the appropriation of money by Congress for a sea clam research project during fiscal year ending June 30, 1965, additional survey work has been scheduled for the late winter and spring of 1965. Two 33-day cruises by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware are planned for the first 6 months of calendar year 1965, and a third 30- to 40-day period of operation is planned for the second half of 1965. It is anticipated that the Bureau's new research vessel Delaware II will be delivered and in operation for continuation of sea clam explorations in 1966 and succeeding years.

Plans are to complete the survey of the presently designated areas I through V before moving into new areas; also production-type fishing is planned for the most promising areas found, to more fully determine the commercial potential of such locations.

Clam Sounder: Gear research for the current and next fiscal year (1965 and 1966) will be concentrated on the fullest development of the clam sounder. Trials and improvements already effected indicate that the device can quite possibly be developed into a sophisticated and accurate research tool. Ultimately it is hoped that this or a similar device can be used to give an objective and dependable index of the abundance of surf clams and/or black quahog (identified by species) available in a given survey area. Such an instrument would greatly facilitate both the speed and accuracy of survey operations. Commercial application would take much of the guesswork and random searching out of the operation.



Fig. 2 - Shows surf clam fishermen sorting clams from shells and other debris taken in jet-dredge catch aboard a commercial fishing vessel.

Future Utilization: Looking toward the future, and supposing that new unexplored beds are located along with better means of harvesting the sea clams, some thought must be given by all concerned to the conservation of that species if the sea clam industry wants to maintain a profitable operation in the coming years. These years of research work should not be aimed towards locating vast beds of sea clams to be utilized by the industry on an unmanaged basis, but rather toward wise commercial utilization that will maintain this clam at a constant high of production.

Note: See Commercial Fisheries Review, November 1964 p. 41; November 1963 p. 28.



Crab

CHESAPEAKE BAY WINTER CATCH MAY BE AFFECTED BY UNUSUALLY WARM WEATHER:

Good weather may mean poor winter crab fishing in Chesapeake Bay, according to the head of shellfish research at the Virginia Institute of Marine Science, Gloucester Point.

The scientist reported large numbers of crabs in Chesapeake Bay in late 1964, even though dredge catches were somewhat erratic. "When water temperatures are above 48° F. one can expect crabs to be feeding and moving about actively," he said. "On the other hand, when the water temperature falls below 46° F, crabs become sluggish, and generally stay put. . . ."

The marine scientist indicated that water temperatures in early December 1964 had not fallen low enough in Chesapeake Bay to halt crab activity. Under the circumstances, crab dredges could make large catches one day, yet upon returning to the same location the following day the watermen might discover that most of the crabs had moved to another location.

Chesapeake water temperatures in the first part of December 1964 were about 4 degrees warmer than the average during the past 6 years. As a result, the crabs which normally stop in the middle of the Bay continued to move farther south. "What we don't know is

where the crabs will eventually bed down when cold weather halts their migration," the shellfish expert said. Some may stop in the region from Lynnhaven to Cape Charles. Others may move into ocean waters before the cold reaches them, and there they will become less available to crab fishermen. (Virginia Institute of Marine Science, December 21, 1964.)



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-NOVEMBER 1964:

Fresh and Frozen: Purchases of fresh and frozen fishery products in November 1964 for the use of the Armed Forces were down 12 percent in quantity but only 5 percent in value from the previous month. In November 1964, purchases were down for shrimp, oysters, and most fish fillet items, with the exception of haddock fillets. Prices for shellfish items moved up sharply in November 1964.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, November 1964 with Comparisons

QUANTITY				VALUE			
Nov.		Jan.-Nov.		Nov.		Jan.-Nov.	
1964	1963	1964	1963	1964	1963	1964	1963
(1,000 Lbs.)				(\$1,000)			
1,970	2,232	24,300	21,722	1,409	1,206	13,712	12,123

Table 2 - Purchases of Principal Fresh and Frozen Fishery Products by Defense Subsistence Supply Centers, November 1964 with Comparisons

Product	November				Jan.-Nov.	
	1964		1963		1964	1963
	Quantity Pounds	Avg. Cost Cents/Pound	Quantity Pounds	Avg. Cost Cents/Pound	Quantity Pounds	
Shrimp:						
Raw headless	96,150	97	1/	1/	1,200,550	1/
Peeled and deveined	240,288	133	1/	1/	1,559,324	1/
Breaded	341,550	88	1/	1/	3,860,770	1/
Molded and breaded	26,300	64	1/	1/	447,620	-
Total shrimp	704,288	104	894,321	69	7,068,264	6,576,065
Scallops	165,200	72	220,975	57	2,587,550	2,384,182
Oysters:						
Eastern	63,340	110	1/	1/	770,881	1/
Pacific	26,396	74	1/	1/	319,078	1/
Total oysters	89,736	100	148,705	89	1,089,959	1,133,930
Clams	12,630	35	35,600	29	235,983	254,742
Fillets:						
Cod	23,400	33	45,731	30	476,616	612,156
Flounder	161,800	31	136,050	27	2,858,452	2,750,977
Haddock	114,760	33	163,560	39	1,766,314	2,012,936
Ocean perch	259,250	29	361,510	31	3,319,970	3,540,351
Haddock portions	131,500	49	-	-	571,322	-
Steaks:						
Halibut	73,950	48	139,047	37	1,206,277	1,333,220
Salmon	21,110	72	13,326	62	249,555	177,076
Swordfish	3,761	58	5,460	52	15,171	31,208

1/Breakdown not available.

Compared with the same month in the previous year, purchases in November 1964 were down 12 percent in quantity, but up 17 percent in value. Average prices were much higher for shrimp and scallops in November 1964. Prices were also up for most of the other items purchased with the exception of ocean perch fillets and haddock fillets.

Total purchases in the first 11 months of 1964 were up 12 percent in quantity and 13 percent in value from those in the same period of the previous year. Purchases of shrimp and scallops showed the largest increase. There was some decline in purchases of oysters, cod fillets, ocean perch fillets, halibut steaks, and swordfish steaks.

Canned: Tuna was the main canned fish item purchased by the Department of Defense in November 1964. In the first 11 months of 1964, total purchases of the 3 principal canned fishery products (tuna, salmon, and sardines)

Product	QUANTITY				VALUE			
	Nov.		Jan.-Nov.		Nov.		Jan.-Nov.	
	1964	1963	1964	1963	1964	1963	1964	1963
Tuna	251	1,011	5,069	4,003	108	416	2,244	1,836
Salmon	1	732	2,750	2,210	1	433	1,631	1,328
Sardine	8	59	301	458	2	22	174	180

were up 22 percent in quantity and 21 percent in value from the same period of 1963 due to larger purchases of canned tuna and salmon.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than shown because data on local purchases are not obtainable.

(2) See Commercial Fisheries Review, Jan. 1965 p. 27.



Great Lakes Fisheries Explorations and Gear Development

LAKE SUPERIOR TRAWLING STUDIES CONTINUED:

M/V "Kaho" Cruise 23 (November 8-December 12, 1964): Finding improved ways of catching and handling Lake Superior commercial fish was the main aim of this cruise in Lake Superior from Whitefish Bay to the Keweenaw Peninsula. This was the last of three 1964 cruises for that purpose by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Kaho. Bottom trawls were used in the survey.

Highlights of the three cruises were: (1) finding new trawlable grounds; (2) taking con-

sistently good catches of chub at certain depths during each cruise; (3) recording fish schools (probably mostly chub) by depth-sounder in areas not being fished by commercial fishermen; and (4) catching species such as smelt and suckers in some drags.

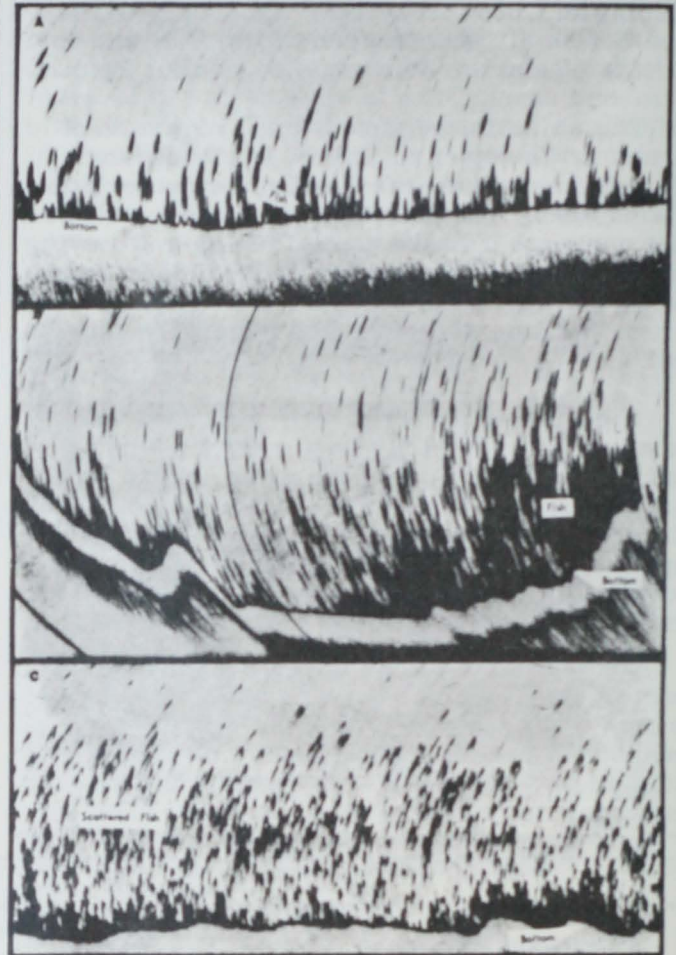


Fig. 1 - Echograms from a high resolution echo-sounder during M/V Kaho cruise 23 showing bottom profile, fish near the bottom, and at midwater depths. A--Echogram made in Whitefish Bay: distance traveled 2 statute miles, depth 35 fathoms, time 9:30 a.m. B--Echogram made off Munising: distance traveled 2.5 statute miles, depth 25-38 fathoms, time 7:40 p.m. C--Echogram made off Keweenaw Bay: distance traveled 2 statute miles, depth 50 fathoms, time 9:00 a.m.

The chub catch rate was good. It would appear practical to trawl for chub even at the relatively low ex-vessel prices offered by the animal-food market. But the chub taken in trawls were of good size and quality so they would bring fishermen much more money on the smoked fish or fillet market.

The primary aim of Kaho cruise 23 was to: (1) determine the seasonal availability of various species of fish to bottom trawls, and (2) locate new areas suitable for trawl-

ing. During cruise 23, the Kaho also: (1) conducted preliminary trials with a midwater trawl and a new high-opening bottom trawl; (2) tested a new type of underwater television system; (3) collected length-frequency data on chub, herring, and alewife; (4) collected

water samples for limnological studies; and (5) collected chub samples for studies on improved processing methods.

Commercially significant catches of chub were taken in the Whitefish Bay area, Shelter Bay near Munising, off Marquette, east of the Keweenaw Peninsula between Grand Traverse Bay and Bete Gris Bay, and in Keweenaw Bay. Catches of cisco were insignificant throughout all areas fished. Good catches of smelt were taken in Whitefish Bay, Keweenaw Bay, and Shelter Bay. Significant catches of common whitefish were obtained in Munising Bay, Huron Bay, and Keweenaw Bay. Two drags in Huron Bay yielded sizable catches of common suckers.

Additional areas suitable for trawling were located south of Manitou Island, in Keweenaw

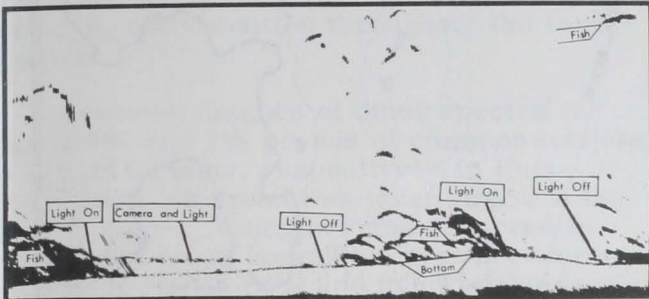


Fig. 2 - Echogram made with a high resolution echo-sounder during underwater television and light trials. Note that fish move away from lighted area while lamp is turned on and return when lamp is turned off. Depth 42 fathoms. Time 9:00 p.m.

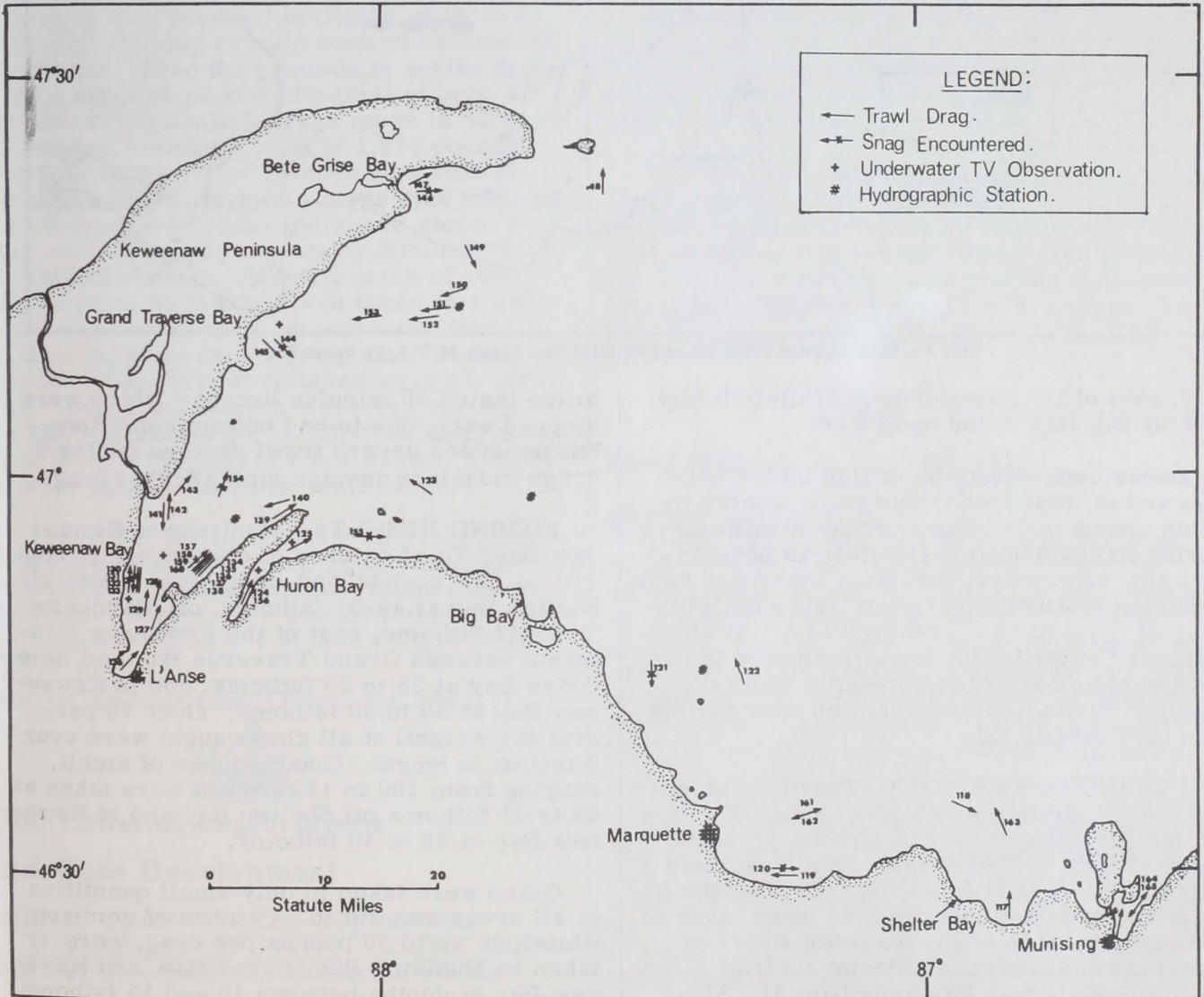


Fig. 3 - Lake Superior explorations (Munising to Keweenaw Peninsula), M/V Kaho cruise 23.

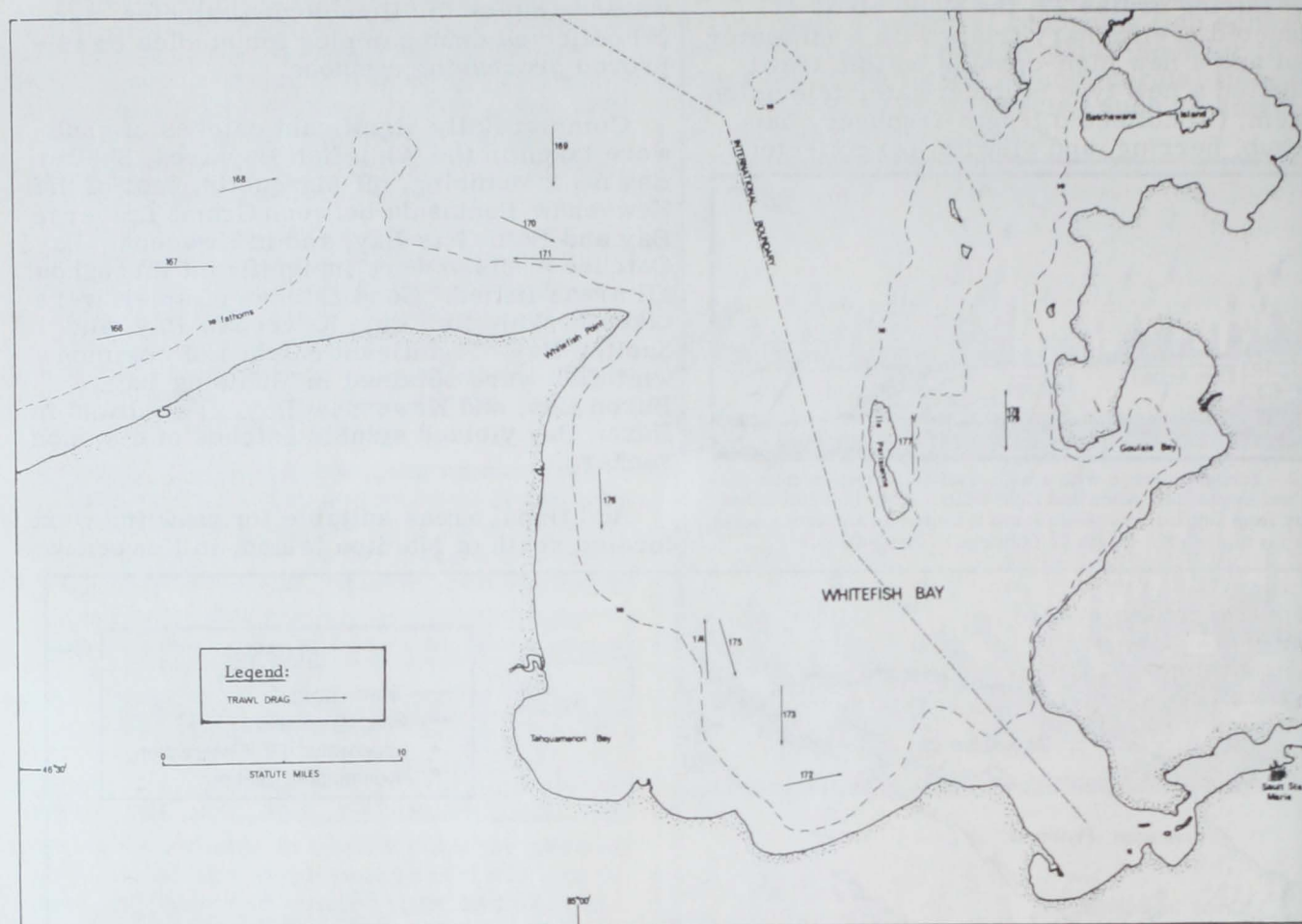


Fig. 4 - Lake Superior explorations (Whitefish Bay Area), M/V Kaho cruise 23.

Bay, east of Ile Parisienne in Whitefish Bay and off Big Bay in the open lake.

Dense concentrations of fish on the bottom and at midwater levels were located by depth sounding in several areas monitored during the cruise (fig. 1). Results of tests with the underwater television system in Lake Superior dramatically illustrated the usefulness of the unit as a research tool. At 45 fathoms the television camera showed the repelling effect of a high-intensity, mercury-vapor lamp on fish concentrated near the bottom at night (fig. 2).

FISHING OPERATIONS: Trawl drags during the cruise totaled 64--including 59 with a 52-foot (headrope) Gulf of Mexico-type fish trawl, 2 with a 40-foot midwater trawl, and 3 with a 70-foot modified wing trawl. Of the 59 standard exploratory drags, 45 were made in the primary area of investigation between Munising and Keweenaw Peninsula (fig. 3) and 14 in the Whitefish Bay area (fig. 4). All

drags lasted 30 minutes except 6 which were stopped early due to bad bottom conditions. Snags caused severe trawl damage during 3 drags and minor damage during 6 other drags.

FISHING RESULTS: Munising to Keweenaw Bay: Good catches of chub ranging from 210 to 620 pounds per drag were taken off Shelter Bay at 49-51 fathoms, off Marquette at 45-47 fathoms, east of the Keweenaw Peninsula between Grand Traverse Bay and Bete Grise Bay at 35 to 55 fathoms, and in Keweenaw Bay at 30 to 50 fathoms. Over 75 percent (by weight) of all chub caught were over 9 inches in length. Good catches of smelt, ranging from 100 to 150 pounds were taken at 49 to 51 fathoms off Shelter Bay and in Keweenaw Bay at 30 to 40 fathoms.

Cisco were taken in only small quantities in all areas monitored. Catches of common whitefish, up to 39 pounds per drag, were taken in Munising Bay, Huron Bay, and Keweenaw Bay at depths between 10 and 15 fathoms.

Catches of lake trout, most of which were under 9 inches in length, amounted to slightly over 7 pounds in those drags yielding trout. The largest number of trout taken per drag occurred in Keweenaw Bay at 30 fathoms. All but one trout captured were fin-clipped. Special efforts were made to return trout to the water in good condition throughout the investigation.

Noteworthy catches of other species included 200 and 255 pounds of commonsuckers at 14 to 10 fathoms, respectively, in Huron Bay. One 7-pound sturgeon was taken in Huron Bay at 14 fathoms. Young herring occurred in most of the drags completed near the Huron Islands, in Huron Bay, and in lower Keweenaw Bay.

Whitefish Bay Area: Echo soundings in the Whitefish Bay area indicated that most of the fish were concentrated in depths of 35 to 45 fathoms. Fishing results confirmed those observations. Nine drags made in depths from 7 to 30 fathoms produced a total of only 38 pounds of fish while 5 drags made in 35 to 45 fathoms yielded a total of 1,870 pounds. The bulk of the latter catches was chub of which one-third were of a large size suitable for smoking. The best individual catch of chub was 770 pounds taken in 35 fathoms north of Whitefish Point. A smelt catch of 200 pounds from 40 fathoms was taken in 1 drag. Smelt catches up to 18 pounds were taken in 4 other drags in depths from 35 to 45 fathoms. The few cisco that were taken were all large fish. Lake trout catches were light throughout the Bay and most of the 51 individuals captured were in the size range of 7 to 9 inches. Catches of other species were insignificant.

HYDROGRAPHIC DATA: Thermal gradients were recorded using a bathythermograph and continuous surface temperature recorder. Surface and bottom temperatures were nearly uniform and both ranged from 32° F. to 46° F.

Note: See Commercial Fisheries Review, Nov. 1964 p. 31



Gulf Fisheries Explorations and Gear Development

SHRIMP GEAR STUDIES CONTINUED:

M/V "George M. Bowers" Cruise 52 (October 21-November 7, 1964): To evaluate

new gear designed specifically for electrical shrimp fishing and compare the results with those previously obtained on the Mississippi grounds (Bowers cruise 51--Phase II, September 15-23, 1964) was the objective of this cruise in the Gulf of Mexico by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers.

The gear used on this cruise was identical to that used on the Mississippi grounds where daytime catches with the electrical gear averaged as high as 96 percent of the night catches in the standard gear. The methods used were also identical--the electric net (designated ES-6) was towed from one outrigger and a net of standard design was towed from the other. The average of the night catches in the standard net was considered 100 percent for purposes of comparison.

Bad weather and mechanical difficulties were encountered on this trip, but a total of 33 one-hour tows was made on the Tortugas shrimp grounds in depths of 12-13 fathoms and 17-18 fathoms.

Results showed the electric net yielded 25 to 50 percent of the night standard average during the daylight hours and 110 to 150 percent at night. Continued study of this gear in the Tortugas area was to be conducted by the George M. Bowers during late November.

Note: See Commercial Fisheries Review, January 1965 p. 31.



Gulf Fishery Investigations

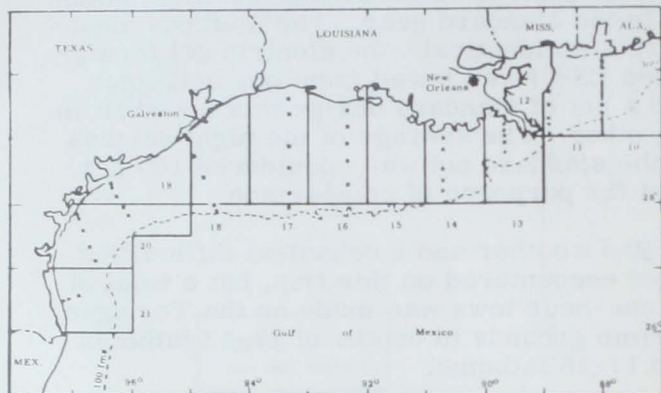
SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-23 (November 10-27, 1964): Very good catches of small white shrimp and better than moderate catches of brown shrimp were made during this cruise in the Gulf of Mexico by the chartered research vessel Gus III. The cruise was one of a series of cruises in a continuing shrimp distribution study conducted by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex.

Eight statistical areas were covered on this cruise and although bad weather hampered operations in western areas of the Gulf, a total of 40 tows with a 45-foot flat trawl was made. In addition, 50 plankton tows, 48 bathythermograph, and 167 water (Nansen bottle) samples were taken. An experimental shell

dredge was used for the first time with excellent results during this cruise.

The largest total catch (194 pounds) of the cruise was from area 13 which yielded 146 pounds of medium size and small shrimp (21-25 and 41-50 count) from the 10-20 and up to 10-fathom depths, as well as 48 pounds of 31-40 count brown shrimp from the over 20-fathom depth. Large white shrimp (30 pounds of 15-20 count) were caught in the up to 10-fathom depth of area 16.



Station pattern for shrimp distribution studies by M/V *Gus III*, Cruise GUS-23.

The best catch from area 14 consisted of 30 pounds of small white shrimp from the up to 10-fathom depth. Catches of brown shrimp in this area were very small--the best from over 20 fathoms which yielded 5 pounds of quite large shrimp (12-15 count).

The over 20-fathom depth in a number of other areas was fairly productive for brown shrimp, with 54 pounds of 21-25 count shrimp from area 21; 46 pounds of 15-20 count from area 20; 39 pounds of 31-40 count from area 16; and 16 pounds of 15-20 count from area 18.

A lion paw scallop, considered rare because not commonly taken, was caught at a 40-fathom station off the Trinity Shoal area.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See *Commercial Fisheries Review*, January 1965 p. 32.



Gulf of Mexico

FISHERY LANDINGS, 1963:

Fish and shellfish landings during 1963 in the Gulf States (West Coast of Florida, Alabama, Mississippi, Louisiana, and Texas) to-

taled nearly 1.4 billion pounds valued at a record \$98.8 million ex vessel. This was a decrease of 37.9 million pounds (3 percent), but an increase of \$4.3 million (5 percent) as compared with 1962.

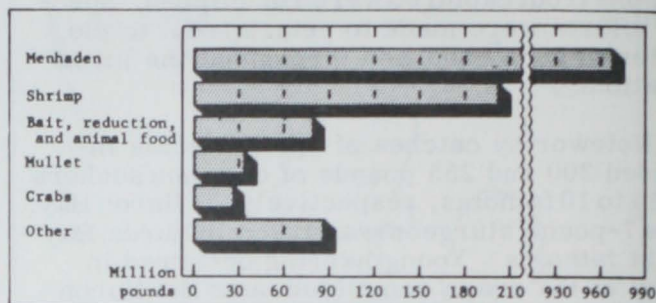


Fig. 1 - Gulf States catch, 1963.

Greatly reduced landings of menhaden (968 million pounds--down 89 million) and unclassified fish for use as bait, reduction, and animal food (80 million pounds--down 17 million) largely accounted for the lower volume. Partially offsetting this decline, however, was a sharp increase in the production of shrimp and oysters. Oyster landings of 24,139,000 pounds of meats showed a gain of 5,301,000 pounds over 1962, and were only 240,000 pounds short of the record 24,379,000 pounds taken in 1939. Shrimp landings totaled 203 million pounds--61 million pounds or 43 percent greater than the landings in 1962.

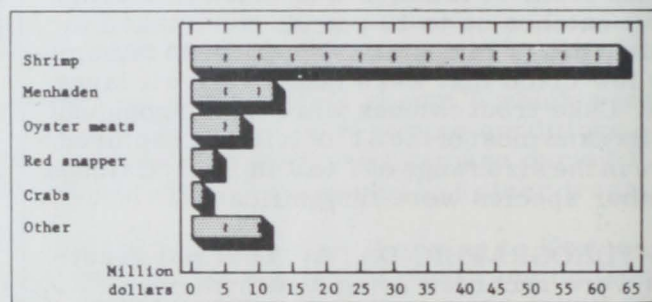


Fig. 2 - Value of Gulf States catch, 1963.

The increase in value resulted principally from production of shrimp--although the ex-vessel price was considerably below that in the previous year.

There were 24,483 fishermen engaged in the Gulf fishery in 1963--1,271 more than in 1962. Commercial fishing craft operating in those States during 1963 consisted of 3,369 vessels of 5 net tons and over, 9,992 motor boats, and 626 other boats.

Manufactured fishery products of the Gulf States in 1963 were valued at \$174 million--an increase of more than \$4 million as compared with 1962.



Industrial Fishery Products

FISH MEAL AND FISH SOLUBLES FIND STRONG DEMAND IN ANIMAL FEED INDUSTRY:

Mixed-feed manufacturers and experiment station scientists concerned with feed were visited in Connecticut, Delaware, New York, and Pennsylvania during late November 1964 by a member of the U. S. Bureau of Commercial Fisheries Technical Advisory Unit, Boston, Mass.

The high esteem in which fish meal is held by producers of poultry and pig feeds was demonstrated by the concern shown by feed manufacturers over future supplies of the product. It may be assumed that the feed producers will not lower the fish meal levels in poultry and pig feeds until compelled to do so by shortages.

Also evident was the high regard that exists for high-quality United States fish meal as compared with imported meal. For example, one feed mill official said that whereas his starter and grower broiler rations both contain fish meal at a level of 5 percent, the former, the more critical ration, contains domestic meal whenever possible.

The experiment station scientists visited were enthusiastic over the use of fish products in mixed feeds. They also showed strong interest in future research on such products. Research scientists at one experiment station announced tentative plans for an investigation of the value of UGF (unidentified growth factor) in egg production. Those workers believe they have evidence that UGF increases egg production significantly when added to a laying ration that contains, with the exception of UGF, every ingredient known to be required by laying hens. If subsequent research confirms that finding, a large new market for fish solubles as a source of UGF may be opened up.

* * * * *

U. S. FISH MEAL, OIL, AND SOLUBLES: Production by Areas, November 1964: Preliminary data on U. S. production of fish meal,

Area	Meal	Oil	Solubles
	Short Tons	1,000 Pounds	Short Tons
November 1964:			
East & Gulf Coasts	6,028	6,362	1,888
West Coast ^{2/}	1,996	452	1,022
Total	8,024	6,814	2,910
Jan.-Nov. 1964			
Total	201,052	164,715	80,576
Jan.-Nov. 1963			
Total	221,056	177,972	87,174

^{1/}Does not include crab meal, shrimp meal, and liver oils.
^{2/}Includes American Samoa and Puerto Rico.

oil, and solubles for November 1964 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.



Maine Sardines

CANNED STOCKS, NOVEMBER 1, 1964:

Canners' stocks of Maine sardines on November 1, 1964, were down sharply from those of the same date in 1963 and 1962, but were 408,000 cases above stocks on hand 3 years ago on November 1, 1961 (the pack for the 1961 season was exceptionally small).

Carryover stocks at the canners' level amounted to about 622,000 cases on April 15, 1964, which is the traditional opening date of the Maine sardine packing season. Carryover stocks amounted to 660,000 cases on April 15, 1963, but only 33,000 cases on April 15, 1962, following the short-pack year.

During April 15-November 7, 1964, the Maine sardine pack totaled 840,000 standard cases, according to the Maine Sardine Council. That was much less than the 1,584,000 cases packed during the same period of 1963, but more than the 640,000 cases packed in the same period in 1961 when fishing was extremely poor.

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, November 1, 1964 with Comparisons^{1/}

Type	Unit	1964/65 Season		1963/64 Season				1962/63 Season				
		11/1/64	7/1/64	6/1/64	4/1/64	1/1/64	11/1/63	7/1/63	6/1/63	4/1/63	1/1/63	11/1/62
Distributors	1,000 actual cases	291	234	254	291	261	308	217	215	264	271	230
Canners	1,000 std. cases ^{2/}	629	514	499	658	1,063	1,255	643	536	699	1,092	1,348

^{1/}Table represents marketing season from November 1-October 31.

^{2/}100 3³/₄-oz. cans equal one standard case.

Source: U.S. Bureau of the Census, Canned Food Report, November 1, 1964.

In November 1964, fishing for Maine sardines was spotty, but most Maine sardine plants were still operating with hopes of reaching a total pack of 900,000 cases by the end of the season, December 1, 1974.

Note: See Commercial Fisheries Review, Sept. 1964 p. 27.

* * * * *

INDUSTRY HOPES TO SELL TO THE PHILIPPINES:

The Republic of the Philippines is one of the world's largest purchasers of sardines and the Maine Sardine Council is seeking to get a substantial amount of this business. At stake is the annual Philippine requirement of canned sardines which is valued at about US\$20 million.

Presently the South Africa Republic is the major supplier of canned sardines to the Philippines, but it appears that the Philippine Republic would rather do its shopping elsewhere. However, price is an important factor and the South Africans are low cost producers.

Sardines are a major part of the diet of the 30 million Filipinos who are probably the world's largest consumers of this item on a per capita basis. NAMARCO, the Philippine Government buying agency, purchases virtually all the sardines consumed in the Philippines. (Maine Sardine Council, December 6, 1964.)



Navigation

OFFSHORE LIGHT TOWERS PART OF U. S. COAST GUARD MODERNIZATION PROGRAM:

To meet increasing demands of a rapidly changing world, the Coast Guard has embarked on a program to modernize its establishment ashore, afloat, and in the air. New vessels acquired by the Service during 1964 included the 210-foot medium-endurance cutters Reliance, Diligence, and Vigilant. It is expected that the goal of fleet modernization will be attained by the early 1970's.

Navigational Aids: Near Southport, N. C., the famous old Frying Pan Shoals Lightship was replaced by an offshore light tower. Eventually, permanent light towers will replace many of the Coast Guard lightships.

The new Frying Pan Light Tower is equipped with communications and oceanographic equipment. The new tower was designed by the Coast Guard to withstand the impact of ex-

traordinary wind and wave actions. Its life expectancy is 75 years. A crew of 6 Coast Guardsmen operate the tower, as compared to the 16 to 20-man crew required to operate a lightship.

The 550-ton deckhouse of the Frying Pan Light Tower is 25 feet high and 86 feet square. It is supported on 4 steel legs spread 60 feet apart. The legs are encased in 36-inch diameter steel pilings driven into the ocean floor. The deckhouse provides living quarters, and its roof can serve as a landing platform for the largest of Coast Guard rescue helicopters.



Fig. 1 - New U.S. Coast Guard Frying Pan Shoals Offshore Light Tower, placed in operation on November 24, 1964, replaces the famous old 133-foot lightship which guarded the shoals 28 miles southeast of Cape Fear, N. C., since she was built in 1930. Here, the lightship Frying Pan circles the tower, gives three farewell whistle blasts, and departs for Morehead City, N. C., to prepare for her new assignment at Cape May, N. J., as a relief lightship. The new tower is equipped with a radiobeacon and a 3.5-million candlepower light which from its elevation 175 feet above water is visible to mariners 17 miles seaward.

In 1964, the Coast Guard's more than 42,000 navigation aids helped to guide travelers both on and over the seas. The aids were of all types, including an atomic-powered lighthouse, as well as a series of 66 LORAN (Long Range Aid to Navigation) stations encompassing the globe. In May 1964, the world's first atomic-powered lighthouse was placed in operation in Chesapeake Bay by the U. S. Coast Guard. It is anticipated that automatic facilities will

eventually supplant many of the manned light stations now in use.



Fig. 2 - An oceanographic student aboard the icebreaker Northwind prepares to lower a gravity meter to the bottom of the Chukchi Sea. Data collected will be used by scientists to measure the thickness and composition of the earth's crust beneath the Arctic basin. The Northwind was used in the U.S. Coast Guard's July to November 1964 Alaskan Patrol. Oceanographic investigations were made in the Beaufort, Chukchi, and East Siberian Seas. The Northwind also conducted measurements of the earth's gravitational field in the vicinity of Wrangell Island off the northeast coast of Siberia, and in the Aleutian Islands before returning to her homeport at Seattle, Wash.

Oceanography: In 1964, the Coast Guard broadened its participation in the national oceanographic effort by equipping half of its major cutters with modern oceanographic instruments. They will conduct long-term, comprehensive surveys of ocean phenomena. In April 1964, the Coast Guard established an Oceanographic Unit which will join with other Federal agencies in an intensive effort to unlock the secrets of the ocean.

Through oceanic studies carried out by its International Ice Patrol, Alaska Patrol, and ocean station vessels in the Atlantic and Pacific, the Coast Guard recorded new gains in its long established marine research program. It has been conducting marine studies since 1867 when the cutter Lincoln was dispatched to explore the waters off the recently purchased Alaskan Territory. (U. S. Coast Guard, January 4, 1965.)



New England Fisheries

GROUNDFISH AND SCALLOP LANDINGS IN 1964 AND FORECAST FOR 1965:

The abundance of groundfish on New England fishing banks is expected to hold steady during 1965, but the abundance of sea scallops will decline, according to the North Atlantic Regional Director of the U. S. Bureau of Commercial Fisheries. That forecast is based on information provided by biologists of the Bureau's Woods Hole Biological Laboratory who check the landings of commercial fishermen and sample fish and shellfish on offshore fishing banks with the research vessel Albatross IV.



Fig. 1 - Unloading haddock at Boston Fish Pier.

Haddock landings in New England in 1964 were approximately 115 million pounds, an increase from the 109 million pounds landed in 1963. The abundance of scrod haddock on New England banks is expected to increase in 1965. The increased abundance will be the result of the large year-class (spawned in 1963) that will enter the fishery as small scrod in the spring of 1965. Albatross IV surveys during the past 2 years indicate that the incoming year-class for 1965 is one of the largest ever found in surveys of the area. However, the following year-class spawned in (1964) appears to be a relatively small one.

Normally a haddock year-class as large as that spawned in 1963 would support the fishery for 2 years, but the situation for 1966 is made uncertain by the increased take of haddock by foreign vessels. What effect this increased foreign catch of haddock will have on United States landings in 1966 cannot be forecast at present.

New England landings of cod in 1964 were about 32 million pounds, compared with 36 million pounds in 1963. Abundance is expected to remain at prevailing levels during 1965.

Landings of ocean perch in New England in 1964 were down to 88 million pounds from the 108 million pound total in 1963. Abundance is expected to remain at present levels, and landings in 1965 will depend on intensity of fishing.

The yellowtail flounder fishery has been enjoying a series of good years due to increased abundance which is expected to remain high in 1965. Landings in 1964 were 77 million pounds compared with 78 million pounds in 1963; landings in 1965 are expected to be equally as good.



Fig. 2 - At Gloucester, Mass., basket of whiting is being swung from the vessel to the conveyor belt hopper on the wharf.

New England landings of whiting (silver hake) in 1964 were about the same as in 1963 (86 million pounds) in spite of intensive whiting fishing on Georges Bank by the U.S.S.R. The effect of the foreign fishing does not yet show on the index of abundance of the whiting stocks fished by the United States fleet. Consequently, there is no reason to believe at this time that whiting availability to the United States fleet will be any less in 1965.

Sea scallops have suffered a decline in abundance during the past 3 years, and Canadian fishing has increased. New England scallop landings declined from 18 million pounds in 1963 to 14 million pounds in 1964, while the 1964 Canadian catch was about the same as the 16 million pounds landed in 1963. Recent surveys by Albatross IV showed a con-

tinuing decrease in abundance so the total Canadian-United States scallop landings are expected to decrease in 1965. The share taken by the United States will depend upon the intensity of U. S. fishing.

Note: See Commercial Fisheries Review, Feb. 1964 p. 36.



North Atlantic

FOREIGN FISHING ACTIVITIES OFF COAST, NOVEMBER-DECEMBER 1964:

In order to observe foreign fishing activities in the North Atlantic, the staff of the Fisheries Resource Management Office, U. S. Bureau of Commercial Fisheries, Gloucester Mass., has been conducting weekly reconnaissance flights cooperatively with the U. S. Coast Guard.

Although there appeared to be only limited Soviet fishing activity during the early part of December 1964, a total of 20 Soviet fishing vessels had been sighted by the end of the month. During the previous month, 26 vessels of similar types were seen. In December 1963 a total of 17 Soviet factory stern trawlers and one refrigerated fish transport was reported.

The Soviet fleet seen this past December was widely scattered over Georges and Browns Banks but gradually shifted its operations southward between Hudson and Black Canyons, 80 miles south of Black Island, R. I., on the western border of the International Commission for Northwest Atlantic Fisheries (ICNAF) convention area.



Shows type of Soviet vessels operating on Georges Bank during October 1964--factory stern trawler (Tropik class) alongside fish transport vessel.

The factory stern trawlers observed during December were fishing in 80 to 100 fathoms and were taking whiting and undetermined quantities of scup (porgy). Their dehydration plants were operating to such an extent that one U. S. fishing vessel some 20 miles away

sent a message to the Coast Guard that a ship was on fire.

This could possibly be an eventual fleet movement to the mid-Atlantic coast area as was the case during the previous winter.

During November 1964, there was a continued decline in Soviet fishing activity on Georges Bank and vicinity. A total of 26 Soviet fishing vessels (identified as 23 factory stern trawlers and 3 transport ships) was observed during November as compared with 47 in October. Their operations were more than double those observed in November 1963.

With the number of Soviet vessels in the Georges Bank area fluctuating from week to week, it was suspected that the Soviets as of the end of November, were alternating their operations between Georges Bank and eastern Nova Scotia areas. That fleet, according to size, was then generally spread out over the banks from the Cultivator Shoals to the Northern Edge of Georges Bank.

During November there was a noticeable drop in the Soviet vessels' catches of herring. This was noted by little or no fish left in the open storage areas on deck as evident when the Soviets were fishing intensively.

Note: See Commercial Fisheries Review, December 1964 p. 50.



North Atlantic Fisheries Explorations and Gear Development

TUNA AND SWORDFISH DISTRIBUTION STUDIES IN WESTERN NORTH ATLANTIC CONTINUED:

M/V "Delaware" Cruise 64-10 (October 15-November 5, 1964): Tuna and swordfish explorations in the western North Atlantic Ocean were continued by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware during this three-week cruise east of New England and south of Nova Scotia. Objectives of the cruise were to: (1) continue a systematic survey of the distribution and abundance of tuna in the Northwest Atlantic; (2) investigate the availability of swordfish beyond areas of the present fishery; (3) evaluate application of synoptic oceanographic information received from the U. S. Naval Oceanographic Office by radio facsimile; and (4) evaluate a powered reel method for handling long-line gear.

Fishing Sets and Results: Sets of long-line gear were made during daylight hours at 8 stations with a total of 3,545 hooks fished. Gear arrangement consisted of a mainline buoyed from the surface at a 10-fathoms depth with eleven 20-fathom sections and 10 branch-lines between buoys.



Fig. 1 - Set-out of long-line gear from powered reel during Delaware cruise 64-10. Note A-K type snap (with branchline) being applied to 20-fathom mainline section.

Albacore tuna (*Thunnus alalunga*) were found at 5 stations with catch rates of 1 to 2 fish per 100 hooks, which approximates those noted on a previous Delaware cruise in this area (Cruise 63-11, November 13-December 10, 1963). Average weight of 27 fish caught



Fig. 2 - Powered long-line reel hauled long-line gear during Delaware cruise 64-10. Hydraulic motor and reducer are at lower left corner of frame. Manual level-winding was required after breakdown of mechanical level-wind device.

was 36.2 pounds; weight range was 26 to 62 pounds. Analysis of the catch position on the gear shows that the lower hooks (middle of mainline curve between buoys) took albacore

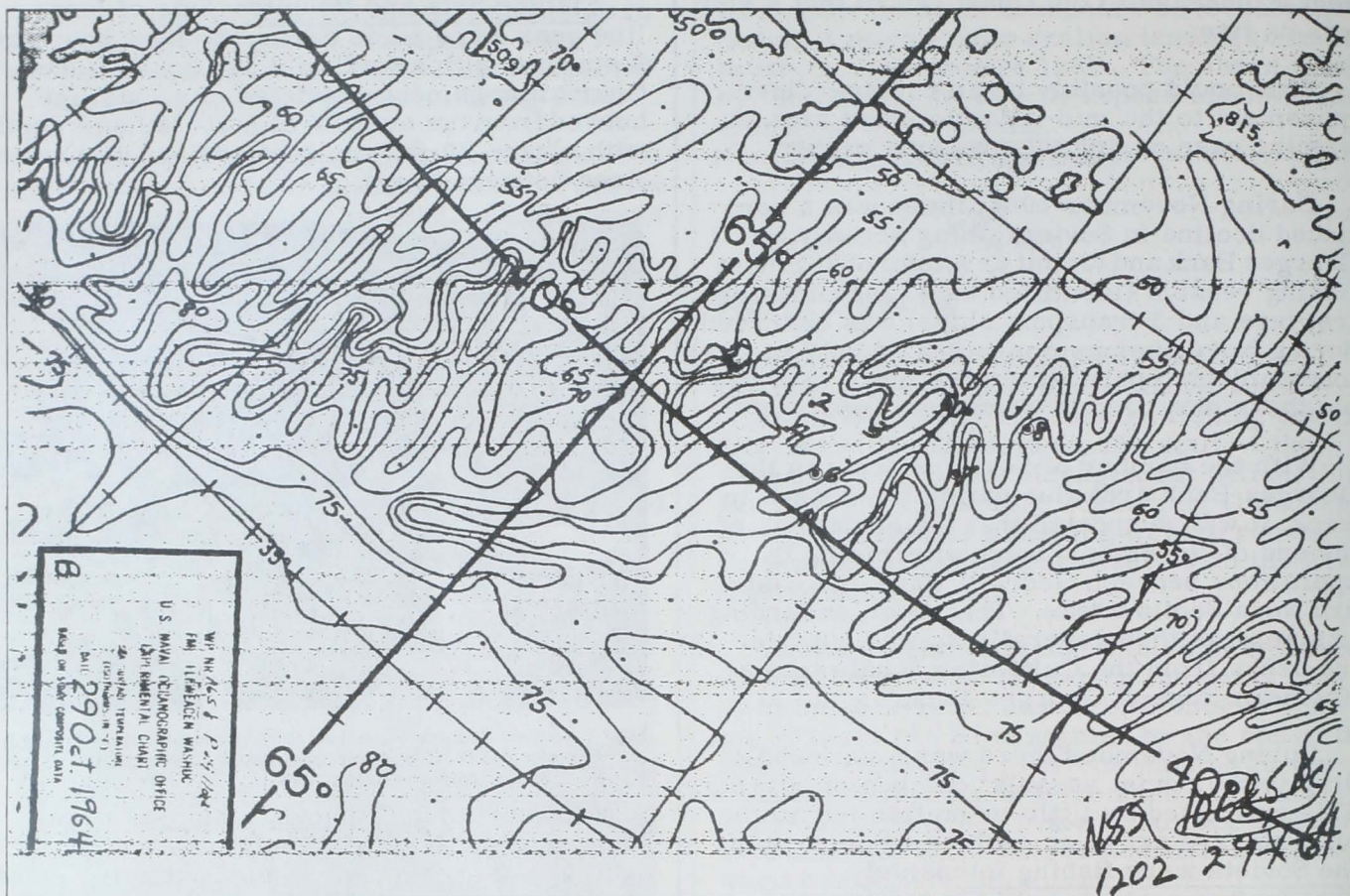


Fig. 3 - Radio-facsimile chart B (Cape Hatteras to the Grand Banks) received on the M/V Delaware during cruise 64-10. Sea surface temperature isotherms are based on 5-day composite data. Long-line fishing stations are numbered 1-8; station 6, 7 and 8 were fished on the basis of this chart. The actual chart measures 19 by 12 inches.

at twice the rate of the upper hooks (ends of main-line curve nearest buoys). Stomach content analysis of 20 albacore and 2 of 11 yellow-fin tuna (Thunnus albacares) taken during the cruise indicated that the albacore were feeding well below the surface, while the yellow-fin had been feeding at the surface. Average weight of the 2 yellowfin examined was 104 pounds. A total of 20 big-eyed tuna (Thunnus obesus) was caught at 6 stations; 6 of those were examined and averaged 95 pounds.

Due to severe weather and sea conditions during the second half of the cruise, no night long-line sets could be made and no swordfish data were obtained.

In cooperation with participating agencies, a total of 30 tuna, 2 white marlin, and 7 shark were tagged and released with dart tags. Tuna blood samples were collected for serological analysis by the Subpopulations Program at the Bureau's Biological Laboratory in Honolulu. Other data collected and examined included lengths, weights, stomach contents,

and sexual condition of all fish taken aboard the vessel. Other long-line catches of particular scientific note were 8 pelagic sting-rays (Dasyatis violacea), and one deep-sea pomfret (Taractes princeps). A 105-pound white marlin (Tetrapturus albidus) taken 260 miles south-southwest of Halifax, Nova Scotia, contained a Z-nickel sportfisherman's hook embedded in its stomach wall, suggesting a movement of this fish to the east from in-shore sportfishing areas west of Cape Cod.

Additional Thermal Data Utilized: During long-line cruises made by the vessel Delaware over the last two years, exact station positions have been determined on the basis of environmental data gathered and evaluated at sea. Bathythermograph (BT) transects and sea-surface thermograph recordings provided much of the information, but have not given synoptic coverage needed to determine most likely fishing areas (current boundaries, thermal gradients, upwellings, eddies, etc.).

Sea-surface temperature isotherm charts with 5° F. increments for the western North Atlantic, from Florida to Newfoundland, have been available for several years from the U. S. Naval Oceanographic Office's radio facsimile broadcasting system at Washington, D. C. Two overlapping 5-day composite charts are transmitted daily; charts are revised twice each week to provide a continuous synopsis of the sea-surface thermal environment.

Radio-facsimile recording equipment installed on the Delaware for this cruise received these charts which were used in determining areas for long-line sets the following day. Continuous thermograph records and bathythermograph casts were made to check the validity of the charts, and to aid in slight navigational adjustments in locating precise thermal conditions for setting. With few exceptions the information from those charts proved accurate to within 10 miles of the positions selected the previous day. Further application and analysis of the charts for locating likely fishing areas is anticipated in future pelagic explorations.

Additional charts received with this equipment included analyses and prognostics for weather, sea, and wave conditions. With experience in interpretation it is expected that this information will directly aid in safer and more economical operation of the vessel in the open ocean area.

Modified Long-Line Gear Trials: Since 1957, long-line explorations of the vessel Delaware have used galvanized tubs ("baskets") and a Japanese long-line hauler to handle gear. For this cruise a hydraulically-powered reel was designed, constructed, and installed to: (1) increase the speed of setting and hauling the gear; (2) increase the safety of long-line operations; and (3) at the same time reduce the number of men required to operate the fishing equipment.

The reel was made of steel, 60 inches in diameter, with a 24-inch diameter core 50 inches in length. The reel frame had a base dimension of 68 x 61½ inches, and a height of 36 inches. Hydraulic power was provided by a 30 horsepower, 45 gallon-per-minute pump system with 1-inch hoses. An automatic level-wind was fitted on the frame and driven by a chain assembly from the reel's shaft. Capacity of the designed reel was 20 miles of 1-inch line with looped and knotted sections of 20 fathoms. Speed and power control con-

sisted of a by-pass lever positioned at the starboard rail fairlead. Three fairleads guided the line during hauling from the rail to the level-wind. In setting the gear (port-side--leeward), one fairlead was positioned on the ship's rail, and the line was backed off under power to obtain correct slack in the mainline. Two tables were set at the port rail to hold tubs of baited branchlines (30 branchlines per tub). The branchlines and buoylines were fitted with halibut-type A-K tuna snaps which were applied to the 20-fathom mainline sections between the knots. Two pairs of men alternated in setting branchlines, one man of each pair placing the snap while the other threw the branchline. Gear was hauled on the starboard side (windward); branchlines were cleared from the mainline and recoiled in the tubs ready for the next set.

Several immediate modifications to the system were indicated during the cruise: (1) the reel and frame should be redesigned for greater strength, the core with a larger diameter and greater length; (2) the level-wind needs redesigning; (3) an auxiliary control should be placed at the reel; (4) an improved branchline tub is required to prevent snarls during set out; (5) a chute parallel to the rail to receive baited hooks would increase safety and reduce the number of men setting branchlines from 4 to 2; and (6) a mainline guide chute after the setting area at the rail would control the angle of mainline on setout to facilitate placing the branchline snaps.

Preliminary results from first trials of the new gear-handling system were encouraging. Both setting and hauling times have been appreciably shortened and further increases in speed are anticipated after modifications. Hooks are now separate from the mainline when the gear is aboard ship, and setting is readily accomplished from the protected (leeward) side of the vessel--both major safety factors. Although the number (6) of men needed on deck was not changed for those early trials, with changes in the system, the number should be decreased by two men.

Note: See Commercial Fisheries Review, September 1964 p. 28.



North Atlantic Fisheries Investigations

SEA HERRING

POPULATION SURVEY CONTINUED:

M/V "Delaware" Cruise 64-9 (October 1-8, 1964): The purpose of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware was to: (1) sample populations of adult sea herring and to obtain related environmental data; (2) obtain sea herring blood samples; (3) make plankton tows for fall-spawned herring larvae; and (4) obtain blood samples and measurements from off-shore lobsters. The areas of operations were Georges Bank, Cashes Ledge, Fipennies Ledge, Jeffreys Ledge, and Platts Bank.

A total of 7 otter-trawl sets and 1 gill-net set were made at stations worked. The trawl sets (45 minutes duration) made in waters from 40 to 55 fathoms yielded herring catches ranging from one-quarter to 110 bushels. The gill-net set yielded only 5 herring. Herring obtained during the cruise were from 19.3 to 35.1 centimeters (7.6 to 13.8 inches) long. Preliminary examination indicated that the 1960 year-class was dominant in all catches. Shipboard examination of gonadal development of adult herring indicated that the majority of fish had spawned. During the cruise 215 herring were sampled for blood which was frozen in liquid nitrogen. No lobsters were obtained.

A total of 33 one-meter net plankton tows lasting 15 minutes each (5 minutes at 10 meters, 5 minutes at 5 meters, and 5 minutes at the surface) were made during the cruise. A total of 362 herring larvae with a mean length of 11 millimeters or 0.4 inches (range 6-20 millimeters) were obtained. About 98 percent of the larvae were from stations on Georges Bank.

Drift bottles (5) and sea-bed drifters (5) were released at each of the plankton tow stations. In addition, at each station bathythermograph (BT) casts were made, surface salinity samples collected, and weather observations recorded. The salinity ranged from 32.7 to 33.1 and surface temperatures ranged from 52.0° F. to 60.0° F. Thermoclines were present at all deep-water stations (40 fathoms or more) and absent in all waters of 25 fathoms or less. The greatest temperature range occurred at one station where a difference of 6° was recorded between 50 and 75 feet.

M/V "Delaware" Cruise 64-11 (November 17-22, 1964): The objectives of this cruise by

the exploratory fishing vessel Delaware were about the same as those of cruise 64-9 conducted in October. The areas of operation were Veatch's Canyon, Hydrographer Canyon, and Georges Bank.

Two lobster trawl sets were made during this cruise. The sets made in waters of 172 and 180 fathoms yielded 31 lobsters of which 25 were females and 6 males. Four of the females were berried. Lobsters that were hard-shelled totaled 22 (the 6 males were all hard-shelled). The mean weight of the catch was about 2½ pounds and the range in weight was ⅛ to 13 pounds each. In addition to those observations, rostrum to cervical groove, orbit to cervical groove, carapace length, and abdomen length measurements were recorded. A total of 28 lobster blood samples were obtained. On this cruise 2 herring trawl sets were made. The sets (45 minutes duration) made in waters of 50 fathoms yielded a total of 17 bushels of herring which were from 21.5 to 32.1 centimeters (8.3 to 12.6 inches) long. The 1960 year-class was dominant in the two catches, followed in percentage of occurrence by the 1961 year-class. Shipboard examination of gonadal development indicated that the majority of the sampled adult herring had spawned (a few running herring were observed), and that the 1961 year-class fish were in stage II and would not spawn until the fall of 1965. One hundred herring blood samples were obtained and frozen in liquid nitrogen.

Plankton operations on lobster consisted of 2 one-meter net plankton tows of 15 minutes duration (at the surface) but no lobster larvae were obtained. Those on herring consisted of 5 one-meter net plankton tows of 15 minutes duration (5 minutes at 10 meters, 5 minutes at 5 meters, and 5 minutes at the surface), 2 at approximately the same sites as where the lobster larvae plankton tows were made, and 3 on Georges Bank. A total of 90 herring larvae with a mean length of 14 millimeters or 0.6 inches (range 7 to 28 mm.) were obtained.

Sea-bed drifters (5) were released at each of the plankton tow stations. Bathythermograph (BT) casts were made at each station, surface salinity samples collected, and weather observations recorded. The salinity ranged from 33.5 to 33.6.

Note: See Commercial Fisheries Review, January 1965 p. 39.

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LARVAL HERRING DISTRIBUTION IN GULF OF MAINE STUDIED:

M/V "Rorqual" Cruise 8-64 (November 3-12, 1964): To determine the distribution of larval herring along the coast of the Gulf of Maine was the objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Rorqual. The area of operations was the coastal area between Cape Ann and Machias Bay within the 50-fathom line.

A total of 21 stations were occupied during the cruise. Oblique tows were made at each station at 6 knots using a Gulf III trawl with a Boothbay Depressor No. 3 and one with a Boothbay Depressor No. 1. The gear usually were towed individually for one mile each at three depths (surface, 10 and 20 meters), or about 33 to 66 feet. When the bottom terrain permitted, tows were made on bottom, halfway to the surface, and at the surface. Special tows were made with a Gulf III and meter net at the surface to obtain lobster larvae.

Nansen-bottle casts were made at each station to depths of 0, 10, 20, 30 meters (from 33 to 98 feet), and immediately above the bottom. Each cast was accompanied by a bathythermograph (BT) lowering, a photometer reading, and a Secchi disc reading. Sea-bed drifters (5) and surface drift bottles (5) were released at each station.

The Boothbay Depressors Nos. 1 and 3, attached to a trawl and Gulf III respectively, were equipped with depth-sounding gear and a record of their stability obtained at various depths and on the bottom.

The number of herring larvae caught by the Gulf III net was similar to that of other years during the fall spawning season. A large number of herring larvae were caught in the trawl which had not been used previously during fall cruises. The largest trawl catch was 2,293 herring larvae with the largest catches in the western portion of the area surveyed. Few larvae of other fish species were taken and no lobster larvae were obtained. No concentrations of fish were detected with the fathometer.

* * * * *

CONTINENTAL SHELF WATERS SURVEYED:

M/V "Albatross IV" Cruise 64-14 (December 13-18, 1964): To conduct an environmental survey of Continental Shelf in North Atlan-

tic waters in the area bounded by longitudes 64° W. and 72° W. was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV.

During the cruise, 75 hydrographic stations were occupied throughout the area. Water samples were obtained at depths of 1, 10, 20, 30, 40, 50, 75, 100, 150, 200, and 250 meters for the determination of temperature, salinity, dissolved oxygen, and chlorophyll. In addition, 24 hydrographic stations were occupied at a fixed position 60 miles south of Martha's Vineyard to determine the temporal fluctuations of those properties, and of zooplankton biomass. Fourteen fish survey stations were made on Georges Bank to complete the fall survey series.

Note: See Commercial Fisheries Review, Nov. 1964 p. 46.



North Pacific Fisheries Explorations and Gear Development

EXPERIMENTAL FISHING WITH PELAGIC TRAWL:

M/V "St. Michael" Cruise 5 (October 26-November 20, 1964): The objectives of this cruise off the coast of Washington by the exploratory fishing vessel St. Michael, chartered by the U. S. Bureau of Commercial Fisheries, were to: (1) conduct fishing trials with the "Cobb" Pelagic trawl rigged to fish off bottom while the otter boards retained bottom contact; (2) make underwater observations of fish behavior within the influence of various trawls; (3) determine the speed of water passing through different parts of a trawl; and (4) conduct fishing trials using two vessels to pull the "Cobb" pelagic trawl and the Bureau designed lampara trawl.

Near-bottom fishing with the Cobb pelagic trawl was undertaken off the coast of Washington in areas of known Pacific hake concentrations. Fishing was restricted by poor weather and a Pacific hake distribution change. The largest single catch was 17,500 pounds taken during a 30-minute tow. Subsequent underwater observations of the trawl indicated the configuration to be less than desirable with the near-bottom hook-up.

Scuba dives were made on the lampara trawl during fishing tests. Pacific herring (Clupea pallasii), surf smelt (Hypomesus

pretiosus), and three-spine stickleback (*Gasterosteus aculeatus*) were observed within the trawl. Large numbers of fish entered into the body of the trawl but resisted moving into the codend. Pacific herring and surf smelt maintained a swimming speed of about 2 knots for periods greater than 25 minutes and swam out of the trawl through the mouth and meshes during net retrieval.

Current measurements at various positions inside and out of the trawl were made while the trawl was being towed. Recordings of water current were made to determine actual swimming speed of fish within the trawl.

Several drags were made on this cruise by pulling various trawls by two vessels. Limited time permitted only enough drags to develop a suitable system of operation. One catch containing 8,000 pounds of herring and smelt was made.

Note: See Commercial Fisheries Review, January 1965 p. 39.

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HAKE POPULATION SURVEY AND PELAGIC TRAWL TESTS CONTINUED:

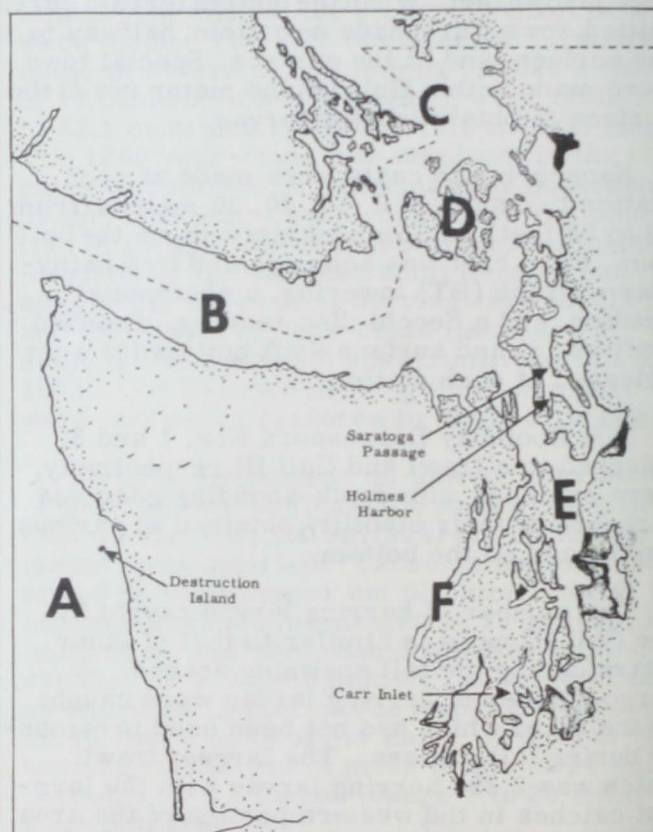
M/V "John N. Cobb" Cruise 68 (October 19-November 20, 1964): This 5-week exploratory midwater trawling cruise was conducted in Puget Sound and along the Washington State coast by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb.

The primary objectives of the cruise were to: (1) investigate the distribution and abundance of hake; (2) evaluate the incidental catches of other pelagic fish taken with the midwater trawl; and (3) cooperate in evaluating the fishing effectiveness of a midwater net used in two-vessel trawling.

Echo-sounding transects were made to locate concentrations of hake, and their availability was measured with the "Cobb" pelagic (midwater) trawl. No concentrations of hake were found in the Strait of Juan de Fuca, Strait of Georgia, or the San Juan Islands area. Small catches of less than 180 pounds of dogfish (*Squalus acanthias*) and yellowtail rockfish (*Sebastes flavidus*) per half hour of trawling were taken in the Strait of Juan de Fuca. Only dogfish were encountered in the Strait of Georgia where catches of less than 50 pounds per half hour of trawling were taken.

Relatively large concentrations of fish were found in Carr Inlet in southern Puget Sound,

Holmes Harbor, and Saratoga Passage in northern Puget Sound, and Hood Canal. Three drags made in Carr Inlet primarily yielded dogfish with the largest catch of 20,000 pounds taken in a 30-minute drag consisting of 14,000 pounds of dogfish, 5,000 pounds of pollock (*Theragra chalcogrammus*), 800 pounds of hake, and 200 pounds of miscellaneous species. Approximately 90 percent of the catches taken in Holmes Harbor, Saratoga Passage, and Hood Canal were hake, with the individual hake catches ranging from 550 to 8,000 pounds per 30-minute drag. All the hake from northern Puget Sound were small, averaging about 35 centimeters (approximately 14 inches) in length compared to an average length of about 56 centimeters (22 inches) for hake caught off the Washington Coast.



Shows areas of operation during John N. Cobb cruise 68. Echo-sounding transects were made off the west coast of Washington State (A), in the Strait of Juan de Fuca (B), Strait of Georgia (C), San Juan Islands area (D), Puget Sound (E), and Hood Canal (F).

Although still present, hake appeared to be less concentrated off the Washington coast than during previous surveys in August and September 1964. Two 1-hour midwater trawl sets yielded catches of 674 and 970 pounds of hake. Yellowtail rockfish and dogfish were the only other species taken off the Washington coast.

During the last week of the cruise, the John N. Cobb participated in gear trials with the chartered vessel St. Michael in Bellingham Bay. During the trials, the two vessels towed a single net over known herring grounds. Four sets were made with the "Cobb" pelagic trawl and two sets were made with the newly developed pelagic trawl (having long wings in a configuration similar to a lampara seine). The highest catch rate obtained was 8,000 pounds of herring and smelt taken in a 1-hour drag.

For limited periods during the cruise, observers came aboard the John N. Cobb from the Washington State Department of Fisheries, Oregon State University, the University of Washington, and Washington Peninsula College.

Note: See Commercial Fisheries Review, Jan. 1965 p. 39; Dec. 1964 p. 52.



Oceanography

UNDERWATER CAMERA SYSTEM DEVELOPED FOR WORK AT GREAT DEPTHS:

An underwater camera for use at the ultimate ocean depth (37,000 feet) has been developed by a firm in Boston, Mass. Equipped with a strobe lighting system, the camera can be lowered from an oceanographic vessel by means of a cable until the camera is a few feet above the surface or object to be photographed. As the research vessel moves along, the camera can take pictures at the rate of 12 per second. The camera carries a 100-foot roll of 35 mm. film which enables it to take up to 500 pictures in one run.

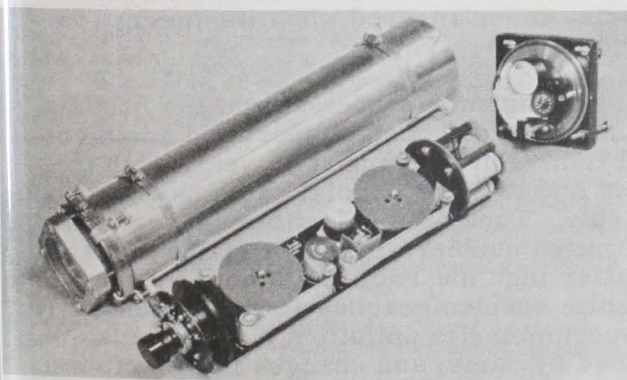


Fig. 1 - Underwater camera and pressureproof housing. The depth capability of the camera is 12,000 meters (39,000 feet).

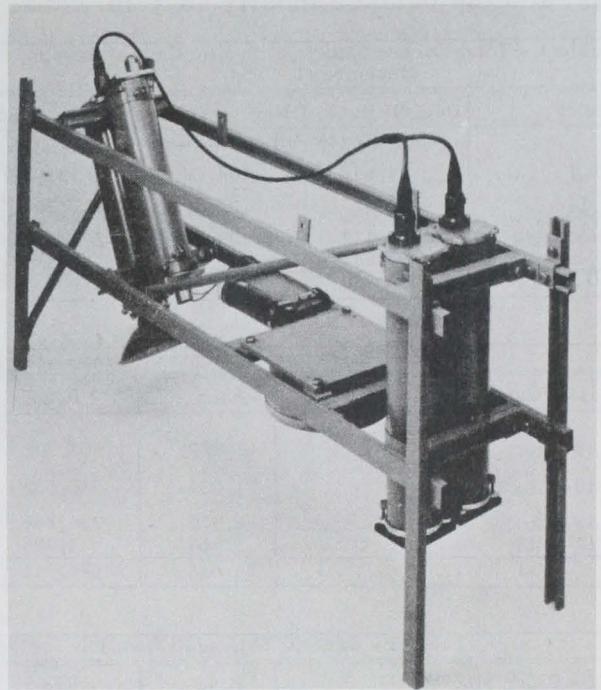


Fig. 2 - "Stereo" system for underwater photography. Mounted on the 6-foot steel frame are 2 cameras, light source, pinger system (for positioning cameras), and current compass. This system carries film to produce up to 500 pairs of bottom photographs covering 17 square meters or more per exposure.

A steel mount for the underwater camera, lighting system, and related components is available. The complex of photographic equipment is available in several designs including a lightweight fisheries system, a 2,300-exposure survey system, and 20-exposure Photo-Grab system. The underwater photographic systems have been used in deep-sea rescue, research, and mapping work.



Salmon

U. S. PACIFIC COAST CANNED STOCKS, DECEMBER 1, 1964:

Canners' stocks in the United States of Pacific canned salmon totaling 3,751,410 actual cases on December 1, 1964, were 280,990 cases less than stocks on hand November 1, 1964. Pink salmon made up 52.7 percent (2.0 million cases, mostly 1-lb. talls) of the total canners' stocks on December 1, 1964, followed by chums (783,000 cases, mostly 1-lb. talls), and reds (675,000 cases). The remainder of about 8.4 percent consisted of coho and king salmon. About 80 percent of

the pink salmon stocks on hand was 48 1-lb. cans, and the balance mostly 48 $\frac{1}{2}$ -lb. cans.

Species	Dec. 1, 1964	Nov. 1, 1964	Oct. 1, 1964
. (No. of Actual Cases)			
King	94,648	104,399	134,337
Red	674,711	750,483	856,770
Coho	222,095	250,162	230,519
Pink	1,977,112	2,109,841	2,218,068
Chum	782,844	817,515	863,474
U.S. Total	3,751,410	4,032,400	4,303,168

SEATTLE, WASH., TO HAVE NEW \$2 MILLION CANNED SALMON WAREHOUSE:

A \$2-million automated warehouse for canned salmon storage is scheduled to be built on a 10-acre site in the Port of Seattle's Lower Dewamish Industrial District, with completion set for May 1966. The storage complex will include a 300,000-square-foot warehouse just across 26th Avenue SW. from Pier 5 and a 1,000-foot tunnel and underground conveyor system to transport salmon between the pier

Case & Can Size	King	Red	Coho	Pink	Chum	Total
. (Actual Cases)						
48 $\frac{1}{4}$ -lb.	11,379	108,105	75,492	8,714	1,222	204,912
48 $\frac{1}{2}$ -lb.	74,034	338,582	42,987	346,666	113,076	915,345
48 1-lb.	8,970	226,866	91,494	1,573,104	646,541	2,546,975
12 4-lb.	265	1,158	12,122	48,628	22,005	84,178
Total	94,648	674,711	222,095	1,977,112	782,844	3,751,410

Case & Can Size	King	Red	Coho	Pink	Chum	Total
. (Actual Cases)						
48 $\frac{1}{4}$ -lb.	12,868	319,827	47,200	2,967	222	383,084
48 $\frac{1}{2}$ -lb.	62,808	348,512	11,388	256,802	45,015	724,525
48 1-lb.	13,151	271,188	77,015	824,820	232,066	1,418,240
12 4-lb.	151	3,792	9,368	50,769	17,537	81,617
Total	88,978	943,319	144,971	1,135,358	294,840	2,607,466

From November 1 to December 1, 1964, pink salmon stocks were lower by 132,729 cases, reds were down 75,772 cases, and chums were down 34,671 cases.

Carryover stocks at the cannery level amounted to 1,175,588 standard cases on July 1, 1964, which is the approximate opening date of the Pacific salmon packing season. Adding the new season pack of 3,922,356 standard cases brought the total available supply this season to 5,097,944 standard cases.

Shipments at the cannery level July 1, 1964, to December 1, 1964, totaled 2,607,466 actual cases (equal to 1,957,890 standard cases).

Information on canned salmon stocks is based on reports from canneries who packed over 97 percent of the 1964 salmon pack. (Division of Statistics and Economics, National Cannery Association, December 24, 1964.)

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and warehouse. (Port of Seattle Reporter, December 1, 1964.)

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INTERIOR DEPARTMENT CLASSIFIES ATLANTIC SALMON AS "ENDANGERED" SPECIES:

Atlantic salmon has been included in a U. S. Department of the Interior list of "endangered" fish, birds, and mammals. A species is endangered when its survival is seriously threatened.

New Englanders once sought the Atlantic salmon as an important sport and commercial fish. But in the past 75 years both the sport and the commercial catch have dropped sharply. Today the Atlantic salmon is found in limited numbers in only 8 Maine streams. Smaller than the Pacific salmon, the adult Atlantic species reaches 10 to 15 pounds. It is succumbing to pollution, obstructions caused by dams, and changes in waterflows.

The list of endangered species was sent for comment to all state game and fish departments and other interested organizations. The cooperation of those groups is being sought for a stepped-up program to preserve endangered wildlife. The U. S. Department of the Interior is considering seeking legislation that would enable it to carry out a 10-year program of land acquisition to preserve the essential habitat of rare and endangered species.



Shellfish

HEALTH PROTECTION OF U. S. SHELLFISH CONSUMERS EMPHASIZED AT NATIONAL SHELLFISH SANITATION MEETING:

There was agreement by participants attending the fifth National Shellfish Sanitation Workshop on major improvements in the health protection of United States consumers of shellfish products, the U. S. Public Health Service announced November 20, 1964.



Conferees of the 5th National Shellfish Sanitation Workshop held in Washington, D. C., November 17-19, 1964, listening to Wesley E. Gilbertson, Chief of the Public Health Service Division of Environmental Engineering and Food Protection.

The three-day meeting, held November 17-19, 1964, at Washington, D. C., was attended by nearly 200 of the Nation's shellfish experts. Participants included shellfish sanitation control officials from 22 shellfish-producing states, representatives from the United States shellfish industry, Federal Government, and from Canada and Japan. Agreement was on the following major points:

1. The Cooperative State-U.S. Public Health Service-Industry Program for the Certification of Interstate Shellfish Shippers is functioning effectively in terms of consumer protection but should continue to strengthen its effectiveness through technical and administrative improvements.
2. Protection of shellfish growing areas from contamination must be a consideration of state and Federal agencies planning or conducting water pollution control and abatement programs.
3. The practice of re-laying shellfish from beds in contaminated growing areas should be carried out on a wider scale wherever practicable to reduce shellfish populations in contaminated areas.

4. Control over shellfish harvesting and transportation of the product to certified dealers should be tightened wherever possible. (In many areas that can be accomplished through inspection of designated "landing areas.")

5. Existing schedules of fines and penalties for harvesting shellfish in polluted areas should be reviewed by the producing states and the U.S. Public Health Service, with a view to better informing the courts on the health consequences of illegal sale of polluted shellfish and enabling the states to seek fines and penalties commensurate with the potential hazard to public health.

6. The states recognize the need for strong marine police supervision of polluted areas, harvesting practices and re-laying, and that adequate funds be made available for those activities.

The Workshop also acted on scores of technical amendments to the U. S. Public Health Service "Manual of Recommended Practice for the Sanitary Control of the Shellfish Industry," all of which are aimed at strengthening the national program. These included controls over sport harvesting, a uniform national sanitation standard for all shellfish, adoption of depuration or the process of in-plant self-purification of shellfish from polluted or marginal waters, establishing shellfish preserves, adopting the practice of aquaculture.

Participants also were addressed by a manufacturer with a proposal for radar surveillance of shellfish growing areas to detect poachers. Other speakers discussed the use of chemicals on or near shellfish growing areas, relationship of shellfish sanitation to pollution abatement, advances in shellfish culture, work of the U. S. Public Health Service shellfish sanitation research centers, shellfish imports, heat-shock method of preparing oysters for shucking, and bacteriological standards for growing areas. (Press release, U. S. Public Health Service, Washington, D. C., November 20, 1964.)



Shrimp

UNITED STATES CONSUMPTION AT RECORD HIGH LEVEL:

The American people are eating more shrimp than ever before and the total consumed is climbing each year, reported the U. S. Department of the Interior, December 3, 1964. On a per capita basis, United States consumers are eating 75 percent more shrimp than in the years immediately following World War II.



Fig. 1 - Peeling shrimp by hand in a Florida breaded shrimp plant.

In the first 6 months of 1964, sales of fresh and frozen shrimp were up 22 percent over the same period a year earlier. Through August 1964, sales were still 18 percent above the first 8 months of 1963. There appears to be no single answer to why Americans are eating more shrimp on a per capita basis. But rising consumer purchasing power, growing consumer preference, development of new shrimp products, wider distribution, quality improvement, and more sales promotion have all been contributing factors.

Sales of frozen breaded shrimp products have increased rapidly since 1950, with new records being set each year. Sharp gains also have been made in sales of frozen peeled and deveined shrimp. Sales of fresh or frozen headless shrimp also have been increasing and shrimp sold in that form still holds the largest share of the market. Economists say that consumption of higher-priced foods such as shrimp is gaining as disposable personal income increases, a significant trend that promises well for the shrimp industry and with expectations of greater consumption as the trend continues.



Fig. 2 - Breaded shrimp moving on conveyor belt to weighing and packing line--Florida breaded shrimp plant.

The domestic shrimp industry is principally in the Gulf States. The United States also imports large quantities of shrimp (167 million pounds in 1963). Mexico has been the principal source with India and Latin American countries supplying increasing quantities in recent years.



Fig. 3 - Weighing and packing breaded shrimp in a Florida plant.

Shrimp prices generally, during the first 8 months of 1964, have been below the same months of 1963, but in August 1964 prices were just about equal to the five-year 1959-63 average for that month.

Shrimp supplies held in cold-storage warehouses on September 1, 1964, were above the 1959-63 average, but those supplies were not large in relation to current consumption. Domestic shrimp landings are generally lower for 1964, but imports for the first 8 months were slightly higher. Record cold-storage warehouse stocks at the beginning of 1964 contributed to the large supply available for consumption in the early months of this year.

The U. S. Bureau of Commercial Fisheries conducts extensive research into increasing shrimp populations, finding new shrimp fishing areas, and developing new and better gear with

which to catch shrimp. Donald L. McKernan, the Bureau Director, said that historically the United States shrimp fishery has been a night-time operation. This is because shrimp burrow into the bottom sediment during daylight hours to avoid predators and consequently are not available for capture by trawl nets. He said research by the Bureau has resulted in the application of low-voltage electricity to the trawls. This technique stimulates shrimp from their burrows up into the water where they are caught by the trawl. The method permits day and night fishing which results in more efficient utilization of vessel and personnel. The low energy levels used have no harmful effect on shrimp or related organisms.

Scientists of the U. S. Bureau of Commercial Fisheries are also continuing research into the distribution, growth, survival, and abundance of shrimp. One goal is the development of culture methods for rearing shrimp from the egg to postlarval stages under seminatural conditions. In recent years, the Bureau has encouraged operators of larger and more powerful vessels to fish farther offshore where new shrimp resources have been discovered by the Bureau's exploratory fishing vessels. At the same time, improved packing and freezing techniques have extended the market area for shrimp, further aiding stability and economic growth in the industry.



South Atlantic States

FISHERY LANDINGS, 1963:

In 1963 landings of fish and shellfish at ports of the South Atlantic States (North Carolina, South Carolina, Georgia, and the East Coast of Florida), including landings from fresh-water areas of Florida, amounted to 371 million pounds, valued at \$19.5 million ex-vessel. Compared with the previous year, this was an increase of over 65 million pounds, but a decrease of nearly \$4 million. Record landings of blue crabs and larger catches of menhaden in North Carolina waters were the major factors in the increased landings. The decline in value was due to an almost complete "crop failure" of shrimp in nearly all South Atlantic waters. In addition to poor catches, the ex-vessel prices for shrimp were relatively low during the peak production periods.

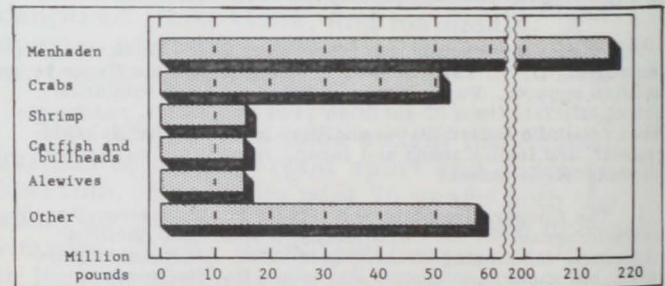


Fig. 1 - South Atlantic States catch, 1963.

There were 11,940 commercial fishermen in the South Atlantic area--569 less than in 1962. Most of the decrease was among fishermen in the shore and boat category. Ves-

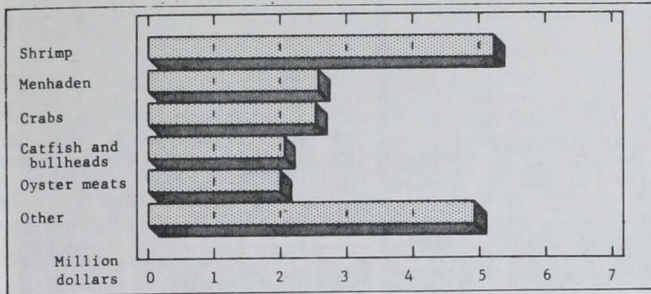


Fig. 2 - Value of South Atlantic States catch, 1963.

sels of 5 net tons and over numbered 1,157--an increase of 16 over the previous year.

Manufactured fishery products of the South Atlantic States in 1963 were valued at \$40.1 million--a decline of \$5.3 million compared with 1962.



Specifications

FEDERAL SPECIFICATIONS FOR CHILLED AND FROZEN FISH:

In Headquarters Notice to the Trade No. 155 (64) of November 13, 1964, the Defense Subsistence Supply Center (DSSC) distributed:

- (1) Deviation List (of May 15, 1964) for Federal Specification PP-F-00381f, Fish--Chilled and Frozen
- (2) DSSC Articles 345 concerning inspection of Fish--Chilled and Frozen

Those instructions will be cited in contracts for Fish--Chilled and Frozen--effective with awards made on and after January 4, 1965.

The Deviation List incorporates changes based upon currently available technical information. Those changes are being processed for inclusion in an amendment or revision of the Federal Specification on Fish--Chilled and Frozen.



United States Fisheries

COMMERCIAL FISHERY LANDINGS, 1964:

Total catch: The U. S. catch of fish and shellfish in 1964 (mostly for the first 11 months and in some instances various periods through December 22) was down about 449 million pounds (11 percent) as compared with 1963. The decline was chiefly in the catches of menhaden, Maine herring, shrimp,

Species	Period	1/1964	1963	Total 1963
. . . (1,000 Lbs.) . . .				
Cod:				
Maine	9 mos.	2,100	1,661	1,960
Mass. 2/	11 "	25,600	30,212	31,475
Total cod		27,700	31,873	33,435
Flounder:				
Maine	9 mos.	1,000	1,115	1,216
Mass.	11 "	85,400	85,580	91,881
Total flounder		86,400	86,695	93,097
Haddock:				
Maine	9 mos.	2,400	2,086	2,877
Mass. 2/	11 "	107,600	102,024	106,075
Total haddock		110,000	104,110	108,952
Halibut: 3/				
Alaska	Year	16,800	22,372	22,372
Wash. and Oregon	Year	9,000	11,871	11,871
Total halibut		25,800	34,243	34,243
Herring, Maine				
	Year	60,000	152,317	152,317
Industrial fish (Me. & Mass.) 4/				
	11 mos.	30,800	47,661	47,897
Mackerel:				
Jack 5/	10 mos.	62,700	84,538	98,078
Pacific 5/	10 "	33,200	30,986	36,974
Menhaden	Year	1,463,000	1,815,798	1,815,798
Ocean perch:				
Maine	9 mos.	45,300	51,229	63,985
Mass.	11 "	29,500	42,109	44,387
Total ocean perch		74,800	93,338	108,292
Pollock:				
Maine	9 mos.	1,000	2,065	2,389
Mass. 2/	11 "	9,200	9,182	10,727
Total pollock		10,200	11,247	13,216
Salmon:				
Alaska	Year	312,000	223,063	223,063
Washington	9 mos.	16,100	48,761	54,993
Sardine, Pacific	to Dec. 22	12,200	7,034	7,131
Scallops, sea, New Bedford (meats)	11 mos.	12,200	15,291	15,941
Shrimp (heads-on), So. Atl. & Gulf	Year	193,200	218,645	218,645
Tuna, Calif.	to Dec. 19	272,100	273,760	285,416
Whiting:				
Maine	9 mos.	25,300	15,942	15,942
Mass.	11 "	47,800	64,477	66,770
Total whiting		73,100	80,419	82,712
Total all above items.		2,875,500	3,359,779	3,430,200
Other 6/		677,200	642,141	1,409,800
Grand total		3,552,700	4,001,920	1,484,000

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

jack mackerel, and Atlantic ocean perch. Landings of industrial fish were down 339 million pounds and food fish down 110 million pounds.

Menhaden: Landings in 1964 totaled 1.5 billion pounds--353 million pounds less than in the same period of 1963. Landings were down along both the Atlantic and Gulf Coasts, with heaviest losses in the Middle Atlantic area.

Salmon: It is estimated that the 1964 catch in Alaska was about 312 million pounds--an increase of 89 million pounds (40 percent) as compared with 1963. Landings of all species

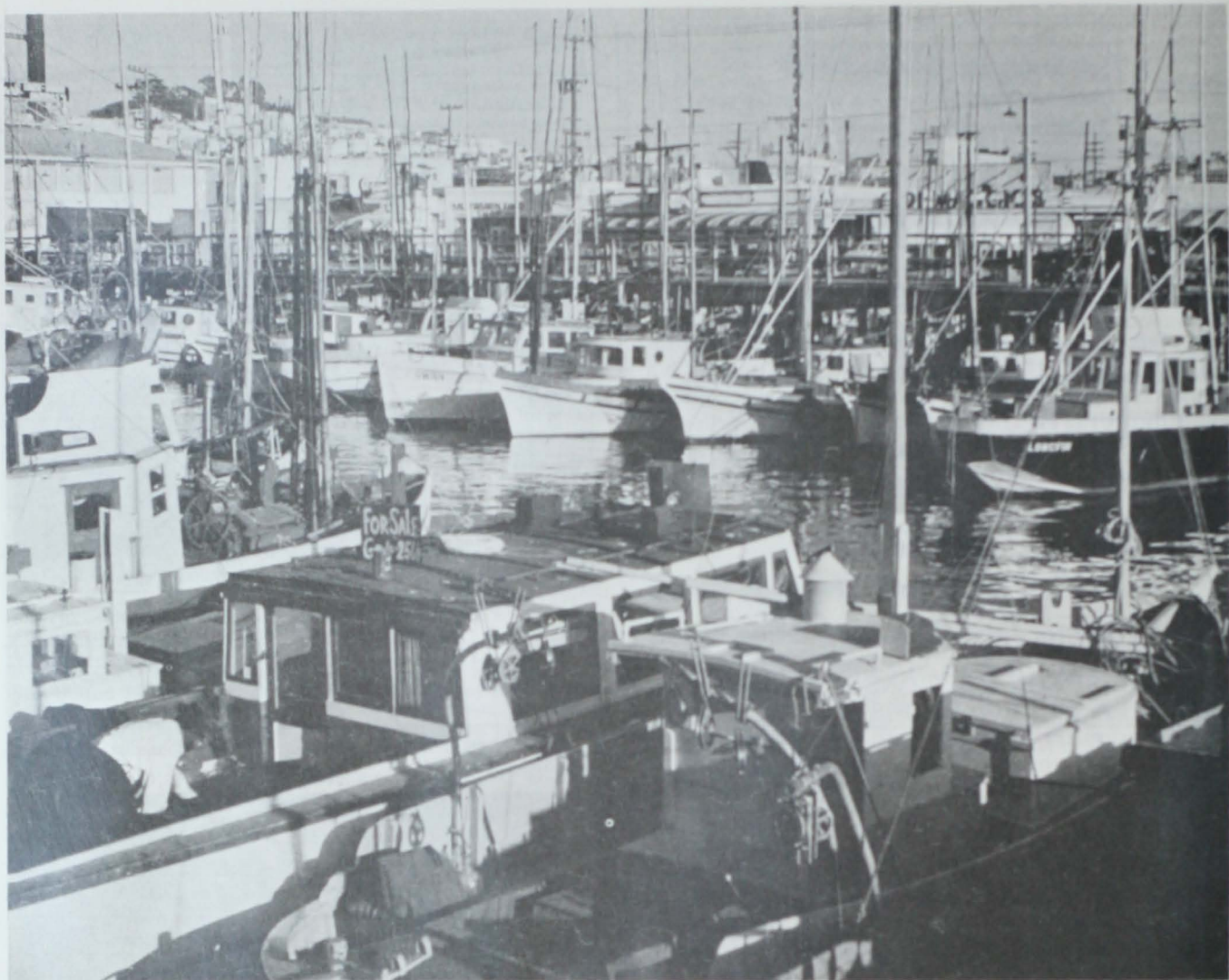


Fig. 1 - Fishing fleet in a West Coast fishing port.



Fig. 2 - Washing a fish-pot catch at Cape May, N.J.

increased, with red, pink, and chum accounting for most of the gain.

Shrimp: The 193 million pounds landed in the South Atlantic and Gulf States in 1964 were 26 million pounds (12 percent) less than in the previous year.

Tuna: Landings of 272 million pounds in California to December 19, 1964, were scarcely 2 million pounds less than during the same period in 1963. In 1964, a 20-million-pound loss in the combined catch of albacore, bluefin, and skipjack tuna was largely offset by increased landings of yellowfin.

Maine herring: Production of Maine herring was only 60 million pounds in 1964--a decline of 92 million pounds (61 percent) as compared with 1963.

Ocean perch: During the first 11 months of 1964, landings in Massachusetts totaled 30 million pounds (down 12 million from the previous year); while Maine landings for the first 9 months of 1964 were 45 million pounds--a decline of 6 million pounds.

Mackerel: Landings through October 1964 were 63 million pounds--a decline of 22 million pounds as compared with the same period of 1963; while Pacific mackerel landings through October 1964 totaled 33 million pounds--a 2-million-pound gain.



U. S. Fishing Vessels

FIRST APPLICATION UNDER NEW FISHING FLEET IMPROVEMENT ACT:

The first application under the new Federal law to assist commercial fishermen in the construction of modern fishing vessels was received from the firm, Boat Pat-San-Marie, Inc., New Bedford, Mass., the U. S. Department of the Interior announced December 24, 1964. That new law--The Fishing Fleet Improvement Act of 1964--provides financial assistance to help offset the higher cost of vessel construction in United States shipyards compared to a representative foreign shipyard. The maximum assistance cannot exceed 50 percent of the domestic cost.

The Massachusetts firm proposes to order from a United States builder a 100-foot all-steel vessel to fish for scallops, groundfish, and flounders.

To qualify for assistance under the Fishing Fleet Improvement Act a proposed vessel must be of advanced design, capable of fishing in expanded areas, and be equipped with newly developed gear. The vessel may not operate in a fishery if such operation would cause economic hardship to efficient vessel operators already operating in that fishery.

As required under the law, a notice was published in the Federal Register announcing a hearing on the application January 25, 1965. Hearings are announced on each application to allow any person who feels he may suffer economic hardship to present evidence demonstrating how he would be injured if the financial assistance were granted.



U. S. Foreign Trade

AIRBORNE IMPORTS OF FISHERY PRODUCTS, AUGUST-SEPTEMBER 1964:

Airborne fishery imports into the United States in August 1964 held fairly steady in comparison to the previous month, but declined in September mainly because of lower shrimp imports from Venezuela.

Total airborne shrimp imports in August 1964 were 1,103,100 pounds, the bulk of which consisted of fresh and frozen raw headless shrimp. Total airborne shrimp imports in September 1964 were 784,500 pounds. About 99 percent of the airborne shrimp arrivals in August and September 1964 entered through the Customs District of Florida. The remainder entered through the Customs Districts of Arizona,

Product and Origin 2/	1964 August		1964 September		1964 Jan.-Sept.		1963 Jan.-Sept.	
	Qty. 3/	Value 4/	Qty. 3/	Value 4/	Qty. 3/	Value 4/	Qty. 3/	Value 4/
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000
Fish:								
Mexico	32.3	4.5	12.3	1.2	313.7	64.0	225.6	63.9
British Honduras	-	-	-	-	1.8	0.4	38.8	9.7
Honduras	-	-	-	-	-	-	16.5	4.3
Japan	-	-	-	-	-	-	2.0	8.2
United Kingdom	-	-	0.1	0.3	2.0	3.9	2.2	5.2
Iran	0.1	0.4	0.1	0.3	0.2	0.7	1.2	7.4
France	-	-	-	-	4.3	7.8	5.2	6.1
Rumania	-	-	-	-	0.9	9.0	-	-
Venezuela	-	-	-	-	4.6	1.7	-	-
U.S.S.R.	-	-	-	-	-	-	26.8	70.2
Denmark	-	-	0.5	0.5	1.5	2.8	-	-
Canada	-	-	-	-	14.8	4.8	-	-
Spain	1.8	0.9	2.1	1.0	7.8	5.2	-	-
Other countries	0.5	0.5	0.5	0.6	4.8	3.8	1.7	0.7
Total fish	34.7	6.3	15.6	3.9	356.4	104.1	320.0	175.7
Shrimp:								
Guatemala	-	-	-	-	-	-	141.6	74.0
El Salvador	-	-	-	-	159.1	96.8	233.6	157.1
Honduras	-	-	-	-	10.3	3.8	99.8	52.3
Nicaragua	1.4	0.8	-	-	79.6	45.6	448.7	142.1
Costa Rica	46.5	23.3	46.5	23.3	296.1	161.2	509.8	242.8
Panama	98.6	58.1	145.2	90.2	812.8	499.1	1,350.7	722.5
Venezuela	955.7	463.2	591.5	307.9	4,671.2	2,202.4	3,999.4	1,877.6
Ecuador	-	-	-	-	-	-	111.6	39.4
France	-	-	-	-	-	-	2.6	0.9
British Guiana	-	-	-	-	10.5	5.2	-	-
Mexico	0.9	0.6	1.2	0.8	2.1	1.4	13.2	6.9
Other countries	-	-	0.1	0.1	12.1	5.2	-	-
Total shrimp	1,103.1	546.0	784.5	422.3	6,053.8	3,020.7	6,911.0	3,315.6
Shellfish other than shrimp:								
Mexico	1.8	1.7	3.6	3.4	14.4	9.9	92.2	53.5
British Honduras	96.2	100.4	20.1	12.5	207.3	165.5	246.8	199.6
El Salvador	-	-	-	-	-	-	5.0	3.6
Honduras	-	-	53.5	68.0	72.9	78.7	5.5	3.3
Nicaragua	-	-	-	-	50.5	40.0	145.9	89.0
Costa Rica	9.3	4.7	-	-	18.6	14.2	73.8	60.1
Jamaica	-	-	9.3	13.4	52.9	49.6	51.0	40.1
Netherlands Antilles	-	-	-	-	-	-	32.8	20.9
Colombia	4.8	4.8	-	-	4.8	4.8	8.0	21.7
Ecuador	-	-	-	-	-	-	2.2	1.8
Tunisia	-	-	-	-	-	-	0.8	0.9
British Guiana	-	-	-	-	14.5	3.2	1.7	0.3
Canada	-	-	-	-	312.9	173.4	213.3	109.2
Venezuela	-	-	-	-	-	-	13.7	6.0
Dominican Rep.	5.1	2.2	2.0	0.4	16.2	4.7	22.2	20.9
Bahamas	-	-	-	-	10.6	6.8	5.3	5.2
Haiti	0.8	0.4	-	-	7.8	4.2	-	-
Other countries	-	-	-	-	0.6	0.7	7.5	6.3
Total	118.0	114.2	88.5	97.7	784.0	555.7	927.7	642.4
Grand total	1,255.8	666.5	888.6	523.9	7,194.2	3,680.5	8,158.7	4,133.7

Puerto Rico, and New Orleans (La.) in August 1964, and through the Customs Districts of Arizona, New York (N.Y.), and Puerto Rico in September 1964. Spiny lobsters from British Honduras were the main shellfish item other than shrimp imported by air in August 1964. In September, spiny lobster tails from Honduras were the principal item other than shrimp imported by air.

Fish fillets from Mexico accounted for the bulk of the airborne finfish imports in both August and September 1964.

Total airborne fishery imports in January-September 1964 were down 11.8 percent in quantity and 11.0 percent in value from those in the same period of 1963. The decline was due to smaller shipments of shrimp and spiny lobsters from Central and South American countries.

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 CANNED TUNA UNDER QUOTA:

United States imports of tuna canned in brine during January 1-November 28, 1964, amounted to 42,801,114 pounds (about 2,038,148 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. This was substantially less (11.2 percent) than the 48,238,342 pounds (about 2,297,064 standard cases) imported during January 1-November 30, 1963.

The quantity of tuna canned in brine which could be imported into the United States during the calendar year 1964 at the 12½-percent rate of duty was limited to 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Any imports in excess of that quota were dutiable at 25 percent ad valorem.

* * * * *

PROCESSED EDIBLE FISHERY PRODUCTS, OCTOBER 1964:

United States imports of processed edible fishery products in October 1964 were up 13 percent in quantity and 19 percent in value from those in the previous month. The increase was due mainly to higher imports of frozen groundfish fillets and blocks from Canada and Iceland. Among the canned items, imports in October were up for canned tuna and canned oysters, but down for canned sardines not in oil and canned crab meat.

Compared with the same month in 1963, imports in October 1964 were up 4 percent in quantity and 6 percent in value. The increase was due mainly to larger imports of canned albacore tuna from Japan, frozen ocean perch fillets from Canada, and groundfish blocks from Canada, Iceland, and Greenland. The increase was partly offset by lower imports of canned sardines in oil, canned salmon, canned crab meat, and canned oysters.

In January-October 1964, imports were up 1 percent in quantity and 5 percent in value from those in January-October 1963. During January-October 1964, there were larger imports of groundfish blocks (increase mainly from Canada and Iceland), ocean perch fillets, flounder fillets, yellow pike fillets, sea catfish fillets, halibut fillets, and canned sardines not in oil. But there was a decline in imports of canned tuna other than albacore, canned crab meat, canned oysters, canned salmon, canned sardines in oil, swordfish fillets, and haddock fillets.

U.S. Imports and Exports of Processed Edible Fishery Products, October 1964 with Comparisons

Item	QUANTITY				VALUE			
	Oct.		Jan.-Oct.		Oct.		Jan.-Oct.	
	1964	1963	1964	1963	1964	1963	1964	1963
	. . . (Millions of Lbs.) (Millions of \$) . . .			
Fish & Shellfish:								
Imports ^{1/} . . .	55.2	53.0	447.9	441.6	16.8	15.9	135.2	128.9
Exports ^{2/} . . .	4.6	3.6	38.3	26.5	3.1	2.1	20.3	12.7

^{1/}Includes only those fishery products classified by the U.S. Bureau of Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i. e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).

^{2/}Excludes fresh and frozen.

Exports of processed edible fish and shellfish from the United States in October 1964 were down 18 percent in quantity and 21.0 percent in value from the high level of shipments in the previous month. Canned salmon exports continued heavy. Shipments of canned salmon totaling 2.7 million pounds in October 1964 were down only 9 percent from the previous month. There was some decline in exports of canned sardines not in oil, but exports of canned shrimp were up.

Compared with the same month of 1963, the exports in October 1964 were up 28 percent in quantity and 48 percent in value. The increase was due mainly to larger shipments of canned salmon. Exports were also up for canned sardines not in oil, but exports were down for canned mackerel, canned shrimp, and canned squid.

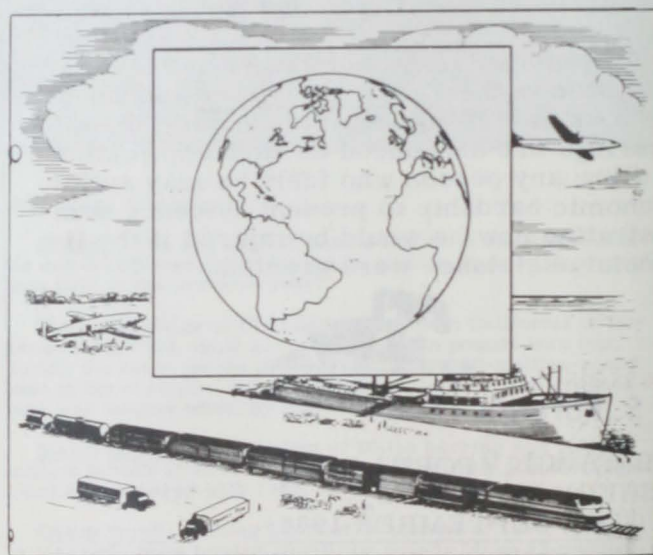
Processed fish and shellfish exports in the first 10 months of 1964 were up 44 percent in quantity and 60 percent in value from those in the same period of 1963. In January-October 1964 there were much larger shipments of canned mackerel and canned salmon. Exports of canned shrimp and canned sardines in oil were also higher, but exports of canned sardines not in oil and canned squid were down.

Note: See *Commercial Fisheries Review*, January 1965 p. 50.

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FISHERY PRODUCTS, 1963:

U. S. foreign trade in fishery products was valued at a record \$547 million in 1963, an increase of \$27 million as compared with 1962. Imports for consumption amounted to \$491 million and exports more than \$56 million. The value of imports was nearly \$6 million more than in 1962, while exports increased \$21 million.



Imports of edible fishery products in 1963 totaled 1.2 billion pounds valued at \$395 million. Compared with 1962, this was a decrease of 5 percent in quantity and 2 percent in value. The loss in quantity was due chiefly to decreases in the imports of fresh and frozen tuna, sea herring, and canned sardines. Total

volume of imports of edible products would have been lower had not imports of groundfish fillets and blocks, shrimp, and sea scallop meats remained at record levels. Other important edible items received in considerable quantity in 1963 were fresh and frozen halibut, tuna loins and discs, fillets (other than groundfish), lobsters (common and spiny); canned tuna in brine; and pickled or salted cod, haddock, hake, pollock, and cusk.

Imports of nonedible fishery products were valued at \$96 million in 1963--15 percent more than in 1962. Increased receipts of fish meal and scrap (376,000 tons valued at \$37 million) largely accounted for the gain in value. Fish meal accounted for nearly 39 percent of the value of all imported nonedible fishery products in 1963. Other important items were cultured and natural pearls (\$18 million) and fish and marine animal oils (\$8 million).

Exports of domestic edible fishery products totaled 64.7 million pounds valued at \$30.4 million--an increase of 15 percent in quantity and 35 percent in value compared with the previous year. The gain was due to exporting greater quantities of fresh and frozen salmon and shrimp. Exports of nonedible domestic fishery products valued at \$26.2 million were nearly double the value of the 1962 exports (\$13.3 million). The increase was due to the record exports of 262.3 million pounds of fish oils. Nearly 76 percent of 1963 exports of oils were sent to Sweden, United Kingdom, and West Germany. Exports of foreign-produced fishery products during 1963 amounted to \$8.5 million compared to \$4.4 million in 1962.



Vessels

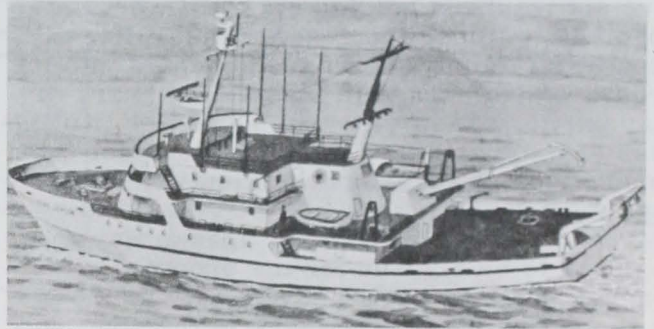
NEW OCEANOGRAPHIC RESEARCH VESSEL

"DAVID STARR JORDAN" LAUNCHED:

The newest vessel in the U. S. Bureau of Commercial Fisheries growing research fleet, the David Starr Jordan, was launched December 19, 1964, at Sturgeon Bay, Wis.

Completion of the David Starr Jordan is expected in May 1965. It will replace the 35-year-old Black Douglas at the Bureau of Commercial Fisheries Fishery-Oceanography Center at La Jolla, Calif. The new vessel

honors the late David Starr Jordan, America's most prominent ichthyologist and the first president of Stanford University. After completion, the \$1.8 million vessel will travel to La Jolla via the Great Lakes, St. Lawrence Seaway, and the Panama Canal.



Artist's conception of the Bureau of Commercial Fisheries' newest research vessel, David Starr Jordan, launched December 19, 1964.

The David Starr Jordan is an all-welded steel vessel, 171 feet long with a 37-foot beam and 11-foot draft. It is powered by twin Diesel engines of more than 500 horsepower each. The David Starr Jordan will have a cruising speed of 12 knots and will be capable of remaining at sea up to 40 days. The cruising range will be more than 8,000 miles.

More than one-third of the vessel's enclosed space will be devoted to laboratories and support areas. It will have laboratories for biological specimens, hydrography, water chemistry, radioactive substances, and sonar surveying. The David Starr Jordan will have accommodations for 13 scientists and 22 crew members.

Additional features include underwater observation stations fore and aft and two 450-cubic-foot wells for live specimens. A unique bow propulsion system will enable the vessel to be pivoted in any direction and, when used in combination with the main engines, will move the ship sideways.



Virginia

MARINE SCIENCE TRAINING PROGRAM FOR TEACHERS AND STUDENTS:

The National Science Foundation has awarded grants amounting to \$33,740 to the Virginia Institute of Marine Science, according to the

Director of the Gloucester Point (Va.) research facility. The funds will be used during the summer of 1965 to conduct a marine science training program for 6 college teachers and 10 undergraduate students.

One grant will support a Research Participation for College Teachers Program and will give six teachers holding the Ph. D. degree an opportunity to use the research facilities at Gloucester Point. Teachers accepted into the program may engage in independent work or may participate in research activities in progress at the Institute. They will be under the supervision of experienced scientific investigators and their work will be related to marine problems of the Chesapeake Bay area. In order to be eligible for the program a teacher must be a full-time faculty member in some university or college in the continental United States. Each will give full time to research for 12 weeks June 14-September 3, 1965.

The Undergraduate Research Participation Program will fund the training of 10 students from colleges and universities of the continental United States who are interested in a career in marine research. They will be given an opportunity to work on research programs in progress and to perform a small research problem of their own under the direction of research personnel at the Virginia Institute. Preference will be given to students who have completed at least two years of college, and have definite ideas about the research they wish to undertake. Their program will extend from June 14-August 21, 1965.

Note: Both college teachers and undergraduates who are interested in securing information about either of the programs should write to: Robert S. Bailey, Director, NSF Programs, Virginia Institute of Marine Science, Gloucester Point, Va. 23062. All applications must be completed by March 1, 1965. (Virginia Institute of Marine Science, December 28, 1964.)



Whales

PACIFIC COAST CATCH, 1964:

The 1964 whaling season on the Pacific Coast closed November 30, 1964. The 2 California stations took a total of 253 whales in 1964 compared with 254 in 1963. The catch by species for those stations for 1963 and 1964 was:

Whale Species	1964	1963
 (No.)	
Sperm	63	77
Humpback	27	55
Finback	147	16
Sei	13	97
Blue	2	6
Bottlenose	1	2
Killer	0	1

The Oregon whaling station took only 1 whale in 1964 as compared with 5 in 1963.



Wholesale Prices

WHOLESALE PRICES FOR EDIBLE FISH AND SHELLFISH, DECEMBER 1964:

Lower prices for ex-vessel haddock and shucked oysters from November to December 1964 were responsible for a 0.6-percent drop from the previous month in the overall wholesale price index for edible fish and shellfish (fresh, frozen, and canned). All other prices for fresh and frozen fishery products listed in the December 1964 index were higher than in the previous month, but those for canned fish remained unchanged. At 109.5 percent of the 1957-59 average, the index in December 1964 was 1.9 percent higher than in the same month of 1963.

The subgroup index for drawn, dressed, or whole finfish dropped 0.5 percent from November to December solely because of lower prices at Boston for ex-vessel large haddock (down 7.7 percent); compared with December 1963 those prices were lower by 25.2 percent. December prices at New York City rose from the previous month for frozen dressed western halibut (up 5.2 percent because of substantially lower inventories) and Great Lakes round yellow pike (up 7.7 percent). As compared with December 1963, the subgroup index in December 1964 was lower by 2.8 percent--haddock prices were considerably lower; there was a slight drop in prices for frozen dressed king salmon; but prices for other items in the subgroup were substantially higher.



Loading a trailer with frozen fish products.

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, December 1964 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)						
			Dec. 1964	Nov. 1964	Dec. 1964	Nov. 1964	Oct. 1964	Dec. 1963			
			ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)								109.5
Fresh & Frozen Fishery Products:					113.8	113.0	116.6	110.5			
Drawn, Dressed, or Whole Finfish:					111.2	111.7	133.4	114.4			
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.13	.14	99.5	107.8	135.5	133.0			
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.40	.38	118.3	112.4	164.1	96.1			
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.83	.83	115.6	115.6	134.1	118.4			
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.51	.50	76.1	74.6	79.8	61.2			
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.70	.65	114.6	106.4	77.8	83.5			
Processed, Fresh (Fish & Shellfish):					111.9	111.1	106.5	111.5			
Fillets, haddock, sml., skins on, 20-lb. tins . .	Boston	lb.	.45	.44	109.3	106.9	97.1	138.4			
Shrimp, lge. (26-30 count), headless, fresh . .	New York	lb.	.90	.88	105.5	102.5	96.7	95.5			
Oysters, shucked, standards	Norfolk	gal.	7.13	7.25	120.1	122.2	120.1	126.5			
Processed, Frozen (Fish & Shellfish):					112.8	110.8	104.7	101.3			
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.37	.35	92.5	88.7	91.2	98.9			
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.40	.39	115.8	112.9	109.9	115.8			
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.30	.30	105.2	103.4	103.4	121.0			
Shrimp, lge. (26-30 count), brown, 5-lb. pkg. .	Chicago	lb.	.96	.95	113.8	112.7	103.2	91.9			
Canned Fishery Products:					102.2	102.2	103.1	102.5			
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . .	Seattle	cs.	21.25	21.25	92.6	92.6	94.8	102.4			
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	98.2			
Mackerel, jack, Calif., No.1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	6.25	6.25	105.9	105.9	105.9	97.5			
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.00	10.00	128.3	128.3	128.3	114.9			

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 subgroup index for processed fresh fish and shellfish in December 1964 rose 0.7 percent from the previous month, but was down 0.4 percent as compared with December 1963. December prices were higher at Boston for fresh haddock fillets (up 2.2 percent) and at New York City for fresh South Atlantic shrimp (up 2.9 percent). Those were offset by a 1.7-percent drop in prices for shucked standard oysters. As compared with the same month a year earlier, fresh shrimp prices in December 1964 were 10.5 percent higher but were partly cancelled out by lower prices for other items in the subgroup.

Most products in the processed frozen fish and shellfish subgroup were higher-priced in December 1964 and the index rose 1.8 percent from the previous month. Prices for frozen flounder fillets were up 4.3 percent from November 1963, but were 6.5 percent below those in December 1963. Price increases in December 1964 for other species of frozen fillets were nominal. Frozen shrimp prices (up 1.0 percent) at Chicago advanced slightly from the previous month but those prices were 23.8 percent higher than in December a year earlier. As compared with the same month

in 1963, the subgroup index in December 1964 was 11.4 percent higher because of a much stronger market for frozen shrimp.

Prices for canned fishery products were mostly steady in December 1964 and there was some indication of improvement in the market outlook for canned pink salmon. Prices in that month for all canned fish items in the subgroup were the same as in the previous month and there was no change in the index. Except for pink salmon, prices for other canned fishery products in the subgroup--tuna, jack mackerel, Maine sardines--remained unchanged from October through December 1964. The 1964 Alaska pack of pink salmon was up nearly 20 percent from the previous year's pack but the new Maine sardine pack was substantially lower than that canned the previous season. The December 1964 subgroup index was only slightly lower (down 0.3 percent) than in the same month a year earlier. Although prices in December 1964 were higher for most of the canned fish items, those for pink salmon were down 9.6 percent from the same month in 1963.

