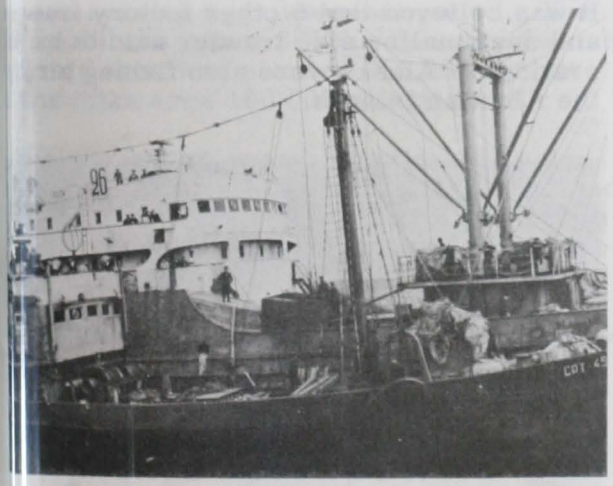
TRENDS AND DEVELOPMENTS

laska

REIGN FISHING ACTIVITY OFF
ASKA, APRIL 1965:

J.S.S.R.: The Soviet trawling fleet off
theast Alaska operated primarily in the
a from west of Cape Ommaney northward
vest of Cape Spencer throughout April 1965.
the size of that fleet became smaller as
or trawl fisheries developed in other a-
s of the Gulf of Alaska. The trawling fleet
Southeast Alaska in April was composed
bout 55 trawlers, 12 freezer vessels, and
w support vessels. Some of the vessels
the fleet early in April and for a short
iod fished off the west coast of Vancouver
nd, British Columbia. Results of trawling
hat area were apparently unsatisfactory
all the vessels reportedly returned to join
Gulf of Alaska fleets.



1 - Soviet medium fish trawler (SRT) in Gulf of Alaska.

nother major Soviet trawling fleet began
loping early in April south of the Kenai
nsula between Middleton Island and Port-
Bank east of Kodiak. By the end of the
th that particular fleet had been expanded
included about 70 vessels comparable to
rawling fleet off Southeast Alaska.

oviet trawling efforts in the western Gulf
laska, primarily between Albatross Bank

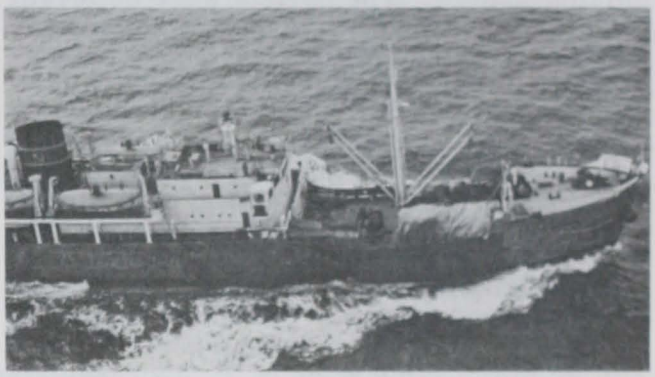


Fig. 2 - Soviet transport refrigerated vessel in Bering Sea.

off southwest Kodiak Island and the Shumagin Islands, were also increased during the month. About 30 trawlers and a few freezer vessels were believed working in the area, including about 8 BMRT factory trawlers. The factory trawlers appeared to be producing fish meal, but it was not known whether they were using whole fish or just fish wastes for meal production.

Observations throughout April were that the Soviet trawling fleets off Southeast Alaska, south of the Kenai Peninsula, and in the western Gulf of Alaska were fishing primarily for Pacific ocean perch, with no significant incidental catch of other species.

Fig. 3 - Soviet king crab factoryship Pavel Chebotnygin.

The Soviet flounder fishing fleet operating in outer Bristol Bay was disbanded by the close of the month, with many of the vessels

reassigned to trawling fleets in the Gulf of Alaska.

Soviet sources announced that 5 of their SRT-M type trawlers had been fishing shrimp in the Gulf of Alaska since February 1965, and that by late April had caught nearly $2\frac{1}{4}$ million pounds of shrimp. It was reported that 2 additional SRT-M trawlers had recently been sent to the Gulf of Alaska to join the shrimp fishery. The Soviets were believed to be fishing the known stocks of shrimp in the Kodiak region where they conducted a shrimp fishery in fall 1964.

After moving out of the king crab pot sanctuary in late March, the king crab factoryship Pavel Chebotnyagin and her two sisterships Aleksandr Obukhov and Konstantin Sukhanov worked their tangle-net fishery northeast of Unimak Pass throughout most of April. Last April reports were that the Soviet king crab fleets were about 80 miles northwest of Port Moller in the same area as the Japanese king crab fleets.

Japan: A second shrimp fishing fleet, the factoryship Einen Maru, accompanied by 15 trawlers, began operations about 45 miles northwest of the Pribilof Islands in late April. The factoryship Chichibu Maru, which has 12 trawlers assigned to her, also operated on the accustomed shrimp fishing grounds north and west of St. Paul Island throughout April.

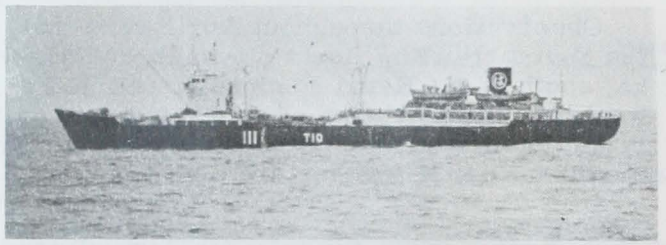


Fig. 4 - Japanese factoryship Einen Maru freezes and processes shrimp caught by its 15 trawlers.

The first of 7 Japanese fish meal fleets scheduled to operate in the eastern Bering Sea in 1965 appeared on the outer Bristol Bay "flats" in late April. That fleet, composed of the factoryship Gyokuei Maru and 26 trawlers, reportedly left Japan on April 9 and arrived on the fishing grounds 85 miles north of Unimak Pass about two weeks later.

Throughout April, the Japanese king crab fleets of the factoryships Tokei Maru and Tainichi Maru, with 10 tangle-net handling trawlers, operated in outer Bristol Bay northwest of Port Moller.

Japanese vessels did not participate in th halibut long-line fishery in the eastern Beri Sea which began in late March of this year. The only long-line fishing reported as of th end of April was the processing-fishing vess Kotoshiro Maru, licensed to be accompanie by 3 long-line vessels, operating near Semi sopochnoi Island in the western Aleutians.

Fig. 5 - Workboat astern and wooden trawler alongside the Japanese fish meal factoryship Gyokuei Maru.

The Japanese factory trawler Tenyo Mar No. 3 was reportedly operating north of Att Island in the central Aleutians in late April It was believed that 5 other factory trawler and one smaller side trawler said to be operating off Alaska were also fishing along the Aleutian Islands.

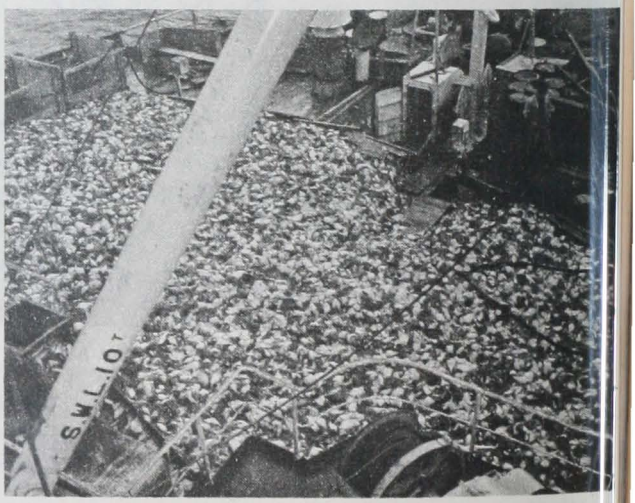


Fig. 6 - Fish on the foredeck of Japanese fish meal factoryship Gyokuei Maru.

All 4 of the Japanese trawlers licensed to operate in the Gulf of Alaska by May 19 were fishing in the area in April. The ves

Takachiko Maru fished for Pacific ocean perch southwest of Unimak Pass throughout April. The Taiyo Maru No. 82 shifted from the Bering Sea about mid-month and joined the Takahiko south of Unalaska Island. The Daishin Maru No. 12 alternated between Albatross Bank off southwest Kodiak and Portlock Bank east of Kodiak. Except for a brief period in early April when the Daishin No. 12 fished for shrimp off southwest Kodiak, her trawling efforts have been for Pacific ocean perch. The fourth Japanese Gulf trawler Akebono Maru No. 53 appeared on Albatross Bank about mid-April. All of those vessels are factory trawlers of 1,500 to 3,500 gross tons.

* * * * *

ANNUAL KELP AND HERRING EGG HARVEST:

The annual harvest of kelp and herring eggs was conducted in the Sitka and Craig areas during April. Participation in that fishery has increased from 2 buyers in 1962 (the first year commercial harvesting was permitted by the state) to about 18 buyers in 1965. During the period, the price to the producer increased from 5 to 20 cents a pound and the number of producers has jumped from 40 to over 200. In 1962, about 48,000 pounds of kelp and herring eggs were harvested. The 1965 quota was set at 300,000 pounds, of which the Craig area was allotted 200,000 pounds and the Sitka area 100,000 pounds.

One processor, operating a fleet of 4 salmon seiners in the Sitka area, took an estimated 40,000 pounds of kelp and herring eggs. The seiners picked up the egg-ladened kelp from harvesters working in skiffs. The seiners also provided the boxes and supplies to the harvesters and hauled the kelp to Craig where a crew of 50, working aboard scows, did the packing and packing. The method of processing involves packing 200 pounds of kelp into 50-gallon kegs, layered with 100 pounds of herring. Once filled, the kegs are flooded with refrigerated brine and sealed. The kegs, or barrels, are then shipped south ready for export to Japan.

Alaska Fisheries Investigations

WINTER SURVIVAL OF PINK SALMON EGGS:

Pink salmon eggs in Southeast Alaska and streams of Prince William Sound seem to have shown good survival in spite of severe low winter temperatures. A deep snow cover may have been the reason. Prince William Sound winter survival observations showed considerable variability in survival, with the excessive mortalities attributed to secondary effects of the severe earthquake of a year earlier. In many sections, areas with excellent egg survival were interspersed with areas of 100-percent mortality. An aerial photographic study during April of Prince William Sound pink salmon streams showed that agradation, degradation, and channel relocations were still in progress as a result of land elevation changes during the earthquake.

* * * * *

PINK SALMON TRANSPLANT SUCCESSFUL:

During fall 1964, biologists of the U.S. Bureau of Commercial Fisheries, in cooperation with Alaska's Department of Fish and Game, used a commercial fishing vessel equipped with live tanks to introduce 1,305 female pink salmon into Sashin Creek at Little Port Walter. The transplant produced about 310,000 preemergent alevins or about 14 percent of potential egg deposition, which is in the range of higher levels of fresh-water survivals observed previously at Sashin Creek. The production of 1964 brood year fry exceeded that of all other even-numbered brood years since 1942 and odd-numbered brood year fry for five years since 1941. Unless the introduced 1964 brood of pink fry experience a marine mortality in excess of 99 percent, the returning run in 1966 will be larger than the parent run.

The use of commercial fishing vessels equipped with live tanks makes it possible to capture large numbers of adult pink salmon and transport them to barren or low-producing streams at relatively low cost. This technique may allow the reestablishment of many runs previously destroyed, as well as allow the introduction of pink salmon in newly created spawning areas.

* * * * *

BROOKS LAKE RED SALMON FRY SURVIVAL:

A general appraisal of fresh-water mortality rates with the use of computer equipment shows that the average monthly mortality rates of red salmon fry have been 14.7 percent. An analysis of Brooks Lake red salmon stocks for the 1957-1961 brood years

shows monthly mortality rates ranging from 16.9 to 20.7 percent, indicating substantially lower survivals in Brooks Lake compared to the rest of the Naknek system. The Ugashik system shows an average monthly mortality rate of 14.2 percent.

American Fishery Advisory Committee

RECOMMENDATIONS MADE AT WASHINGTON, D. C., MEETING:

Increased development of the underutilized fishery resources of the United States was recommended by the American Fisheries Advisory Committee which met in Washington, D. C., during May 1965. The Committee, established in 1955 to advise the Secretary of the Interior on fisheries matters, concluded that a larger domestic fishery catch and a subsequent improvement of the American fishing industry would result in stronger competition with rising imports of fishery products.

A five-step program was outlined by the Committee as a means of increasing the commercial catch by United States fishermen: (1) Federal construction of one or more vessels of a proven type for use by the industry in demonstrating new methods of profitably harvesting underutilized fishery resources; (2) Automation of harvesting and processing techniques to reduce increasing labor costs; (3) Development of new and high-quality products with built-in marketing services designed to attract consumers; (4) Studies leading to establishment of uniform State commercial fishing regulations, and removal of those which unnecessarily inhibit development of fishery resources; and (5) Continuation of intensive efforts to develop an acceptable fish protein concentrate.

Other recommendations made by the Committee included enactment of legislation to extend the Fishery Loan Program, scheduled for termination on June 30, 1965, and the continuation of research on the effects that pesticides, pollution, and the destruction of fish spawning and nursery areas have on fishery resources.

Staff members of the U. S. Fish and Wildlife Service briefed the Committee on domestic and international problems affecting the United States fishing industry; fisheries legislation; oceanography; quality improvement in fishery products; special programs involving the International Biological Program, International Cooperation Year, the Potomac River Project, and the program of the Bureau of Commercial Fisheries during fiscal year 1966.

The Committee agreed that development of an acceptable fish protein concentrate would provide the domestic fishing industry with a market for underdeveloped fishery resources readily available in coastal waters. Scale models of fish protein concentrate processing-units developed by the U. S. Bureau of Commercial Fisheries at Beltsville, Md., were inspected by the Committee during the Washington, D. C. meeting.

Note: See Commercial Fisheries Review, December 1964 p. 25

California

PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 65-A-2-Pelagic Fish (April 1-10, 1965): The objectives of this cruise by the California Department of Fish and Game research vessel Alaska in the coastal waters of southern California from Hutington Beach to Ventura were to: (1) experiment with the midwater trawl to improve its effectiveness as a sampling device (general objectives were to improve net opening, ease of handling, and fishing-depth determination); (2) test the wireless depth telemetering system in the field and develop operational techniques; (3) evaluate two small midwater trawls for possible use on pelagic fish surveys; and (4) observe anchovy schooling behavior and reaction to midwater trawling.

The large (50-foot) midwater trawl used on the cruise was fished with various otter door hook-ups and net-spreading devices. The best apparent net opening was obtained with regular large hydrofoil doors positioned 3 fathoms in advance of the headrope, and some new hydrofoil quarter-doors 1½ fathoms ahead of the footrope. The upper bridle was 46½ fathoms long, and the lower was 45. Twenty-four trawl floats were attached to the headrope. This arrangement gave a vertical net opening of 42 feet and an estimated 40- to 45-foot horizontal opening. The most significant improvements obtained were a greater

ontal spread of the foot rope and easier ing during the setting operation. The r bottom bridles caused the net to fish oms deeper than previously.

t fishing depths were determined at vari- speeds and with various amounts of cable. ratio of cable out to fishing depth ranged 6.5 to 1 with 40 fathoms out to 3 to 1 00 fathoms out. The net reacted slowly ed and cable length changes. It usually red 5 or more minutes for the net to ize at a constant depth.

wireless depth telemetering system o Net Sonde model FNZ-5) was tested xcellent results. With that system, net fish schools, and sea bottom are si- eously displayed on an echo-sounder recorder. A dial readout is also pro- or more precise net depth determina- The system was operated to its maxi- epth of 65 fathoms and performed well all weather conditions.

5-foot midwater trawl was fished to ine its value as a sampling device on fish surveys. But the trials were d by extremely poor weather and a scar- fish. Comparative advantages over ge net were ease and safety of handling, d manpower requirements, and the a- o operate under more adverse weather ons.

0-foot midwater trawl was fished from . Small hydrofoil doors gave an excel- rizontal spread but excessive door re- e and small mesh size reduced towing Such a trawl may be useful for cap- fish samples in extremely shallow bays, dirty" water. The vessel's 50-foot was towed toward anchovy schools lo- visually. Aircraft and vessel observa- howed the schools moved out of the 's path as it approached, with the re- at catches were small or nonexistent. mall anchovy schools were located by under in deep water during daylight Tows made through those areas yield- 150 pounds in a 20-minute tow. With roach of darkness those anchovy schools ed and rose close to the surface.

weather was bad throughout the cruise tailed much of the scheduled work. No oncentrations of fish were located or during this cruise.

Commercial Fisheries Review, May 1965 p. 13.

Central Pacific Fisheries Investigations

FORECAST FOR SUMMER 1965
HAWAIIAN SKIPJACK TUNA FISHERY:

Environmental conditions for catching skipjack tuna (aku) in Hawaiian waters looked favorable starting in February this year, according to scientists of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, who predict that the summer 1965 skipjack tuna catch will be average or above average.

The skipjack is Hawaii's dominant fishery, with about 10 million pounds landed every year. The peak of the catch is midsummer and the July take is about 10 times that in February.

The Bureau's Honolulu Laboratory's scientists have found that at least two environmental conditions affect the availability of skipjack during the summer. One is the type of water around the islands during the peak fishing season. The other environmental condition is the time that the nearshore waters start to become warmer in late winter or early spring. Running westward across the Pacific lies one of the major oceanic currents, the California Current Extension, which sweeps from the coast of Mexico to join the Equatorial Current west of the international date line. Its waters are lower in salinity than those of the adjacent North Pacific Central Water. In most summers, the northern edge of the California Current Extension moves northward, bathing the Hawaiian Islands in warm water of low salinity.

When the water starts warming up in early February and when the lower salinity water reaches the islands in the summer, the skipjack tuna catch is good, or has been for the 13 years for which precise records of the U. S. Bureau of Commercial Fisheries are available. When the water warms up in late March and the lower salinity water does not reach the islands in summer, the catch is low. When one of those conditions occur but not the other, the skipjack catch is about average.

The Bureau scientists say that no one can yet predict whether the lower salinity water will or will not reach the islands, but the onset of the warming trend is readily measured.

This year (1965), the scientists say initial warming of the water began late in February,

which is one indication that the 1965 skipjack tuna catch will be average or possibly above average. Annual mean salinities this past April seemed to show a declining trend. On that basis, an oceanographer of the Bureau's Honolulu Biological Laboratory concluded that the environmental conditions looked favorable and that average or above average availability of skipjack in Hawaiian waters could be expected during summer 1965.

* * * * *

TUNA BEHAVIOR AND RESPONSE TO SIGNALS STUDIED:

Live tuna caught in Hawaiian waters during an April 1965 cruise by the U. S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert were returned to the Bureau's Biological Laboratory at Kewalo Basin, Honolulu, Hawaii, for fish behavior studies. A total of 68 live tuna in the Laboratory's holding tanks were being taught to respond to simple electrical and acoustical signals in the course of research on what and how well tuna hear and see.

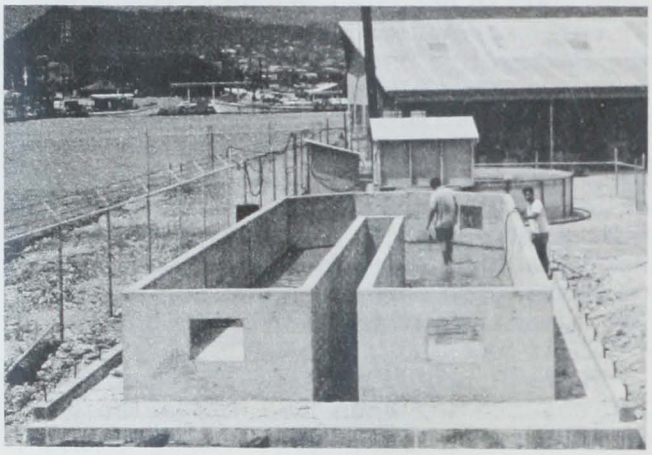


Fig. 1 - Behavior study tank (without quonset hut mounted) for skipjack tuna.

The information gained from the fish behavior studies is a basic requirement if fishing techniques are to be significantly improved, says the Area Director of the U. S. Bureau of Commercial Fisheries at Honolulu. The fish behavioral work is directed by a scientist of the Bureau's Honolulu Biological Laboratory who is assisted by a group of biologists who know more about the world of the tuna, probably, than anyone else anywhere.

One of the interesting results that has come out of those studies is knowledge that tuna really cannot see nor hear very well, in the human sense. Work at the laboratory has shown that tuna cannot distinguish fo of objects underwater nearly as well as h mans can. One of the laboratory biologis did this by giving himself and his cowork the same tests he gave the fish. The biol gist who is studying how well tuna hear fi they are most responsive to sounds near cycles a second and are deaf to sounds hi er than 2,000 cycles a second. The huma ear, by comparison, hears sounds up to 15,000 cycles a second or more.

At the Bureau's laboratory, daily trai sessions are held with the tuna. In learn ability, the fish are much like people, th biologists say. Some are very quick to l others seem to learn nothing. The "star pil" was a skipjack tuna that learned the simple visual acuity routine in 3 days. I fish does not learn within 1 week, it is re placed with another.

Fig. 2 - Skipjack tuna behavior study tank with quonset hut mounted.

The tuna collected by the Bureau's research vessel Charles H. Gilbert cruise were caught on Pengiun Bank and on the l ward side of Oahu between Honolulu and Kaena Point. Tuna caught at sea were pl in portable tanks aboard the vessel. On t turn to the laboratory at Kewalo Basin, t were put in 24-foot portable swimming p which constitute the fish-testing facility. Tuna are very sensitive to handling. It i only after a long period of research at t Bureau's Honolulu Laboratory that meth have been designed to keep them alive fo long periods.

Note: See Commercial Fisheries Review, May 1965 p. 4

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TRADE WIND ZONE OCEANOGRAPHIC STUDIES CONTINUE

M/V "Townsend Cromwell" Cruise 14 (March 8-28, 1965): A predominantly so westerly flow south of the Hawaiian Islan and a variable and complex flow to the s again was the characteristic flow patter

rea investigated during the March 1965
e of the research vessel Townsend Crom-
The vessel, operated by the U. S. Bu-
of Commercial Fisheries Biological
ratory, Honolulu, Hawaii, on March 28
pleted the 13th in a series of oceano-
ic cruises to determine the rate of
e in the distribution of properties in the
wind zone of the North Pacific Ocean.
rea of operations was in the Central
Pacific bounded by latitudes 10° N.,
., and longitudes 148° W., 158° W.

e flow pattern observed during March,
at from the previous month's cruise,
d from the flow pattern of a year ear-
The eddies observed during this latest
were less well developed in the north-
rtion of the cruise area while the south-
ly flow in the southern portion was
er. As compared with observations in
ary 1965, the more sharply sloping
of the 20° C. isotherm surface showed
e latter flow had intensified. A com-
ystem of eddies still remained east of
lands during this latest cruise.

ring the cruise, surface temperatures
to rise to 26° C. (78.8° F.) south of
., an increase of 1° C. since the previ-
ruise. North of 20° N., however, cool-
d continued. The lowest temperature
ded was 20.5° C. (68.9° F.) in the north-
rn corner, a drop of 0.5° C. since Feb-

otal of 43 oceanographic stations was
ed along the cruise track. At each sta-
mperatures and samples for salinity
es were obtained at depths to 1,500
s (4,921 feet). In addition, deep casts
00 meters (13,123 feet) were taken at
ns 21 and 25 and a cast to 5,000 meters
feet) was taken at station 38.

d flocks sighted during the cruise num-
43 as compared with 41 in February.
rast with the previous month's cruise
ost were sighted in the southeastern
of the cruise area, the bird flocks
oncentrated in latitudes north and south
slands along 154° W. and 157° W.

er operations during the cruise in-
taking the usual series of bathythermo-
, sea surface temperatures (including
of a Hytech salinity-temperature-
situ recorder on an experimental basis),
release of drift bottles, and other oceanographic data.

Note: See Commercial Fisheries Review, May 1965 p. 15.

Federal Purchases of Fishery Products

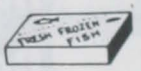
DEFENSE DEPARTMENT'S NEW INSPECTION REQUIREMENTS FOR CHILLED AND FROZEN FISH:

New inspection requirements, effective July 6, 1965, for chilled or frozen fish purchased under Federal Specification PP-F-381 by the U. S. Department of Defense were announced in Headquarters Notice to the Trade No. 44 (65) of May 3, 1965, issued by the Defense Subsistence Supply Center (DSSC), Chicago, Ill.

The new inspection requirements are contained in DSSC Articles 345 of July 6, 1965 (which replace DSSC Articles 345 of January 4, 1965), and will be cited in DSSC contracts for chilled or frozen fish awarded on and after July 6, 1965.

Copies of the revised inspection requirements may be obtained from regional offices of the Defense Subsistence Supply Center.

Note: See Commercial Fisheries Review, Feb. 1965 p. 41.



Fish Species Identification

NEW AND QUICK METHOD DEVELOPED FOR SPECIES IDENTIFICATION OF PROCESSED PRODUCTS:

A new and simple, but precise, method for identifying the species of processed fish has been developed by the U. S. Bureau of Commercial Fisheries Technological Laboratory, Gloucester, Mass. The species of fish can be positively identified in less than an hour by this new method of identification. It is considered a major improvement over other species identification methods which require more time and more highly trained personnel.

The new technique developed by the Bureau's Gloucester Technological Laboratory uses cellulose polyacetate strip electrophoresis to separate the soluble protein of fish muscle into patterns thereby establishing a distinctive fingerprint for each species of fish. The method can be applied under field

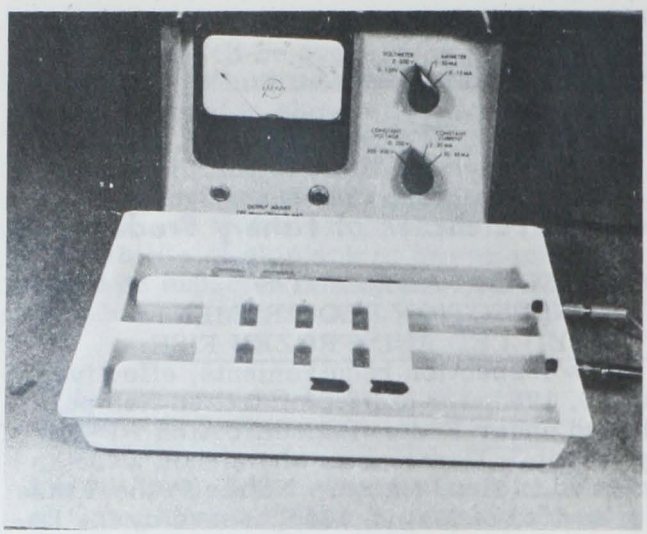


Fig. 1 - Equipment used in new quick method of identifying species of processed fish.

conditions by anyone without special training in laboratory techniques. This testing method will be an invaluable tool to processors and buyers in positively identifying fish used in preparing processed fishery products such as fish sticks, fish portions, and other processed fishery products.

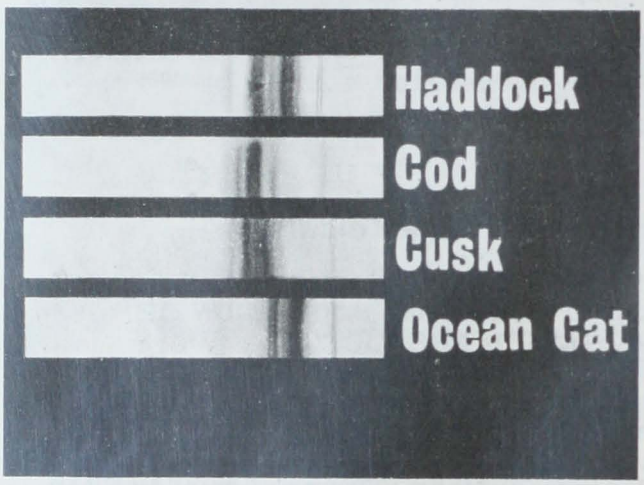


Fig. 2 - Shows identifying species patterns obtained by new method of identifying species of processed fish.

Members of the fishery and related industries were invited to attend a meeting June 4, 1965, at the Bureau's Gloucester Technological Laboratory to observe demonstrations of this new procedure.

Great Lakes Fisheries Explorations and Gear Development

SEASONAL DISTRIBUTION AND ABUNDANCE STUDIES OF ALEWIFE, CHUB, AND YELLOW PERCH IN LAKE MICHIGAN:

M/V "Kaho" Cruise 24 (April 13-28, 196
This 15-day cruise was the first this year i
a continuing series to extend knowledge on
the seasonal distribution and abundance of
alewife and chub stocks in Lake Michigan
and Green Bay and their availability to bot-
tom trawls. Other objectives of the cruise
by the U. S. Bureau of Commercial Fisheri
exploratory fishing vessel Kaho were to: (1
collect growth data on chub, alewife, and
yellow perch for biological investigations;
(2) collect fish and bottom samples for botu
lism studies; and (3) obtain sculpin sample
for technological analyses. The cruise plan
was altered with fishing effort shifted to a
station in the southern portion of the lake b
cause of ice conditions in northern waters.

Fig. 1 - A 1,500-pound lift of alewife by a Lake Michigan tr
vessel.

Commercially significant quantities of alewife were caught only off Port Washing-
ton, Wis. Catches of alewife were extrem
light at all depths off Ludington, Mich., an
Manitowoc, Wis. Alewife were absent fro
all trawl catches made in Green Bay and
virtually absent in the open lake off Sturge
Bay. Chub catches were generally light in
all areas fished. Only a small amount of
yellow perch was taken--one individual in
the open lake and a total of 56 pounds in
Green Bay.

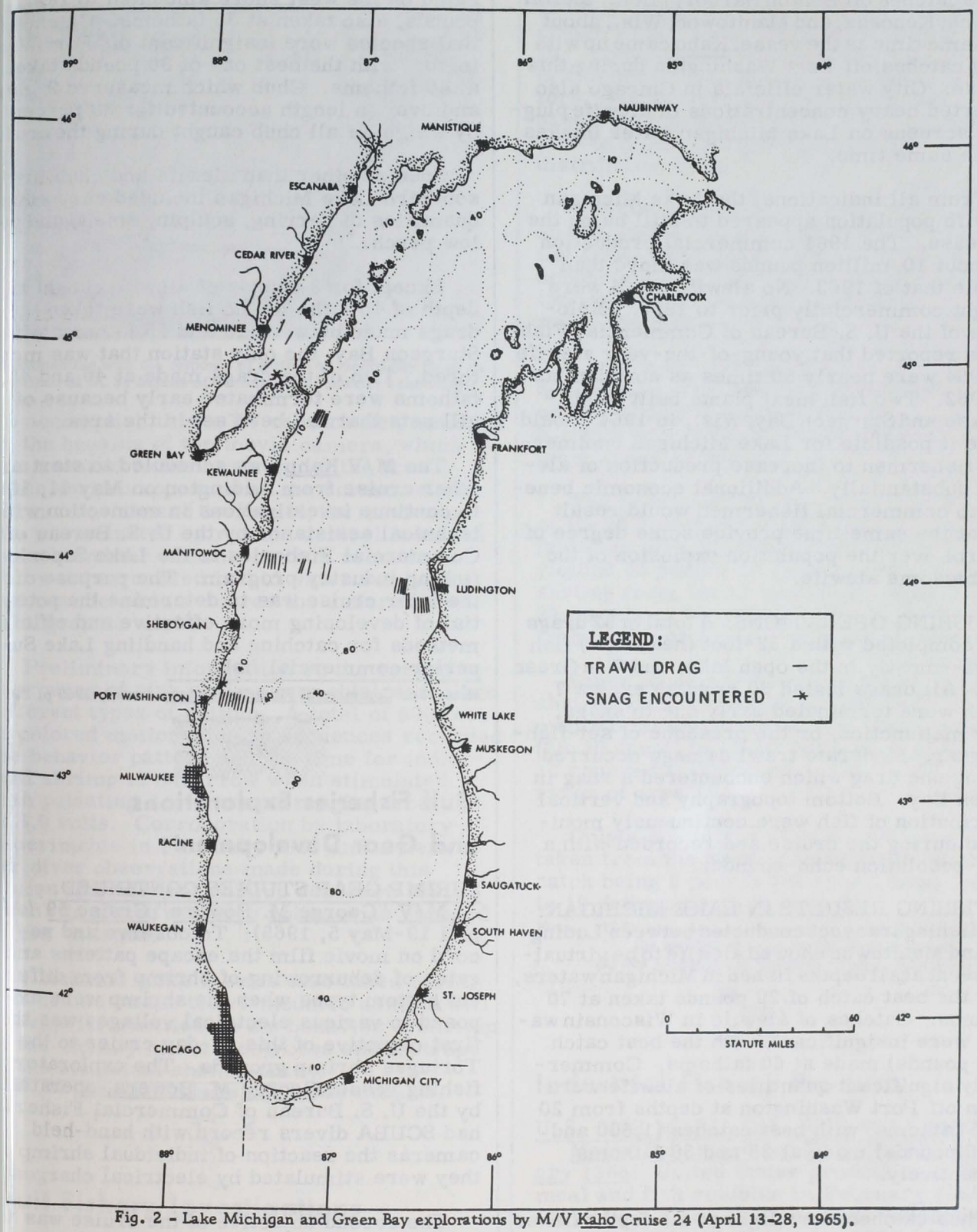


Fig. 2 - Lake Michigan and Green Bay explorations by M/V Kaho Cruise 24 (April 13-28, 1965).

LAKE MICHIGAN COMMERCIAL ALEWIFE PRODUCTION SUMMARY: Lake Michigan alewife were not as readily available to commercial trawlers early in 1965 as in 1964 when ice and storm conditions were much less severe. Commercial trawlers started making

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, February 1965

Item and Period	1/1965	1964	1963	1962	1961
	(Short Tons)				
Fish Meal:					
Production:					
January	2,770	2,092	2,335	2,941	2,723
February	2,257	2,313	2,897	3,616	2,071
Jan.-Feb. 2/	5,027	4,405	5,232	6,557	4,794
Year 3/	-	235,252	255,907	312,259	311,265
Imports:					
January	16,033	30,975	18,495	25,427	9,531
February	25,480	35,309	40,086	18,819	14,344
Jan.-Feb.	41,513	66,284	58,581	44,246	23,875
Year	-	439,143	376,321	252,307	217,845
Fish Solubles 4/:					
Production:					
January	907	1,501	1,662	1,808	1,620
February	803	906	1,465	1,726	1,650
Jan.-Feb. 2/	1,710	2,407	3,127	3,534	3,270
Year 3/	-	93,296	107,402	124,649	112,254
Imports:					
January	650	358	148	273	219
February	1,665	524	169	2,249	155
Jan.-Feb.	2,315	882	317	2,522	374
Year	-	4,505	7,112	6,308	6,739
	(1,000 Lbs.)				
Fish Oils:					
Production:					
January	573	526	491	769	473
February	478	229	358	408	356
Jan.-Feb. 2/	1,051	755	849	1,177	829
Year 3/	-	180,198	185,827	250,075	258,118
Exports:					
January	-	165	79	509	13,449
February	-	23,533	2,458	21,647	17,456
Jan.-Feb.	-	23,698	2,537	22,156	30,905
Year	-	151,469	262,342	123,050	122,486

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

* * * * *

Production by Areas April 1965: Preliminary data on U.S. production of fish meal, oil, and solubles for April 1965 as collected by the U.S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U.S. Production 1/ of Fish Meal, Oil, and Solubles, April 1965 (Preliminary) with Comparisons

Area	Meal	Oil	Solubles
	Short Tons	1,000 Pounds	Short Tons
April 1965:			
East & Gulf Coasts	9,184	10,009	3,004
West Coast 2/	1,705	230	1,142
Total	10,889	10,239	4,146
Jan.-Apr. 1965 Total	18,674	11,832	6,944
Jan.-Apr. 1964 Total	15,651	5,824	7,293

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

* * * * *

Production, February 1965: During February 1965, a total of 478,000 pounds of marine animal oils and 2,257 tons of fish meal was produced in the United States. Compared with February 1964 this was an increase of 249,000 pounds of marine-animal oils but a decrease of 56 tons of fish meal and scrap. Fish solubles production amounted to 803 tons--a decrease of 103 tons as compared with February 1964.

U. S. Production of Fish Meal, Oil, and Solubles, February 1965 1/ with Comparisons

Product	Feb. 1/1965	Feb. 1964	Jan.-Feb. 1/1965	Jan.-Feb. 1964	Total 1964
	(Short Tons)				
Fish Meal and Scrap:					
Herring	298	156	542	415	8,881
Menhaden 2/	-	-	3/	130	160,349
Tuna and mackerel	1,635	1,486	3,549	2,125	21,113
Unclassified	324	671	936	1,735	34,809
Total	2,257	2,313	5,027	4,405	225,152
Shellfish, marine-animal meal and scrap	4/	4/	4/	4/	10,100
Grand total meal and scrap	4/	4/	4/	4/	235,252
Fish solubles:					
Menhaden	-	-	-	60	68,738
Other	803	906	1,710	2,347	24,558
Total	803	906	1,710	2,407	93,296
	(1,000 Pounds)				
Oil, body:					
Herring	124	8	287	132	10,354
Menhaden	-	-	2/	63	157,730
Tuna and mackerel	254	112	490	339	4,816
Other (including whale)	100	109	274	221	7,298
Total oil	478	229	1,051	755	180,198

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

* * * * *

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-February 1965: Based on domestic production and imports, the United States available supply of fish meal for the first 2 months in 1965 amounted to 46,540 short tons--24,149 tons (or 34.2 percent) less than during the same period in 1964. Domestic production was 622 tons (or 14.1 percent) more but imports were 24,771 tons (or 37 percent) lower than in January-February 1964. Peru continued to lead other countries with shipments of 32,512 tons.

The United States supply of fish solubles during January-February 1965 amounted to 4,025 tons--an increase of 22.4 percent as compared with the same period in 1964. Domestic production dropped 29.0 percent, but imports of fish solubles increased 162.5 percent.

U. Supply of Fish Meal and Solubles, January-February 1965

Item	January		Jan.-Feb.		Total
	1/1965	1964	1965	1964	1964
	(Short Tons)				
Fish Meal and Scrap:					
Domestic production:					
Menhaden	2/	130	2/	130	160,349
Tuna and mackerel	1,914	639	3,549	2,125	21,113
Herring, Alaska	244	259	542	415	8,881
Other	612	1,064	936	1,735	44,909
Total production	2,770	2,092	5,027	4,405	235,252
Imports:					
Canada	2,408	4,150	6,046	7,803	54,769
Peru	11,933	25,090	32,512	55,222	348,025
Chile	1,102	-	2,080	1,051	12,942
S. Africa Rep.	-	1,528	200	1,678	18,581
Other countries	590	207	675	530	4,826
Total imports	16,033	30,975	41,513	66,284	439,143
Available fish meal supply	18,803	33,067	46,540	70,689	674,395
Fish Solubles:					
Domestic production 3/	907	1,501	1,710	2,407	93,296
Imports:					
Canada	100	85	249	345	1,553
S. Africa Rep.	-	109	-	339	987
Other countries	550	164	2,066	198	1,965
Total imports	650	358	2,315	882	4,505
Available fish solubles supply	1,557	1,859	4,025	3,289	97,801

1/ Preliminary.
2/ Included with "other."
3/ 50 percent solids.

Maine Sardines

CANNED STOCKS, APRIL 1, 1965:

On April 1, 1965--just before the new packing season opened--canners' stocks of Maine sardines were down sharply from those of the same date in 1964 and 1963.

Final data show the 1964 pack as 865,751 standard cases (100 cans of $3\frac{3}{4}$-oz.) canned in 13 plants in Maine. (Partially included is a small winter 1964/65 pack from Canadian plants of 40,000 cases.) That was much less than the 1,619,000 cases packed during 1963, but more than the 754,000 cases packed during the regular season in 1961 when fishing was extremely poor.

The new Maine sardine canning season opened on the traditional date of April 15, 1965. But in the light of past experience, volume production was not expected until late May or early June. With carryover stocks at a low level, a pack of 1.5 to 1.6 million cases has been predicted for 1965.

The new law legalizing year-round canning of Maine sardines will remove the traditional December 1 closing date for the packing season. The new legislation will open winter canning to all Maine sardine packers and will allow winter canning with domestic as well as imported herring.

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

Marketing

EDIBLE FISHERY PRODUCTS, 1964 AND FIRST HALF OF 1965:

Total supplies in the United States of edible fishery products in 1964 dropped only fractionally from the previous year's all-time high. U. S. imports of fish and shellfish again rose and provided nearly half the total available supplies for the year. The 1964 domestic fishery catch was below the previous year.

Supplies of fishery products were sufficient during the year to maintain the U. S. per capita consumption of fish and shellfish at 10.6 pounds (edible weight). Per capita consumption of canned fishery products declined in 1964, offsetting an increase in consumption of fresh and frozen fishery products.

More salmon, blue and king crab, haddock, and yellowfin tuna were landed in 1964. But

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, April 1, 1965, with Comparisons 1/

Type	Unit	1964/65 Season			1963/64 Season					1962/63 Season			
		4/1/65	1/1/65	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
Distributors	1,000 actual cases	236	238	291	234	254	291	261	308	217	215	264	271
	1,000 std. cases 2/	314	538	629	514	499	658	1,063	1,255	643	536	699	1,092

1/ Type represents marketing season from November 1-October 31.
2/ $3\frac{3}{4}$-oz. cans equal one standard case.

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

Source: U.S. Bureau of the Census, Canned Food Report, April 1, 1965.

catches of other species were significantly lower than the previous year, including Atlantic herring (sardines), shrimp, ocean perch, West Coast mackerel, albacore, bluefin, and skipjack tuna, and North Pacific halibut.

Frozen stocks of fishery products on hand at the beginning of the second quarter 1965 were down more than a tenth from a year earlier. Cold-storage holdings of cod, haddock, and ocean perch fillets were substantially lower. Stocks of fish sticks and portions, halibut, whiting, shrimp, and spiny lobster tails were below those for the same period a year earlier. Crab and crab meat (mostly king crab) were among several frozen items held in larger quantity than in 1964.

Although fishing effort is this year increasing seasonally, supplies will likely continue limited during the second quarter 1965 and prices will average higher than a year earlier. Nearly half of the domestic catch of edible fish will be landed during June-September, with the peak reached in July and August. As a result, stocks of many popular frozen fishery products will not be replenished until then.

Present market conditions point to increased imports of edible fishery products this year, particularly shellfish products and groundfish (cod, haddock, etc.) blocks for producing fish sticks and portions. The United States continues to be the world's largest importer of fishery products even though unused resources with a potential, perhaps as much as five times the present catch, are available in waters usually fished by United States fishermen.

Note: This analysis was prepared by the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the Department of Agriculture's May 1965 issue of the National Food Situation (NFS-112).

Mussels

TENNESSEE RIVER HARVEST DECLINE RELATED TO OVERFISHING:

Overharvesting has played a definite part in the decline of Tennessee River mussel beds. That was announced in a progress report issued in early May 1965 on a Tennessee Valley Authority (TVA) study of the problem begun in 1963.

A mussel takes at least 10 years to grow a marketable shell, and TVA biologists estimate the mussel boats have been taking shells from the Tennessee about 20 times as fast as they were being replaced by natural growth. The 1964 mussel harvest on the river dropped to a record low of only 2,100 tons valued at about $294,000. In previous years the harvest had often been above 10,000 tons, valued at up to $1.3 million.

The growing demand from the Japanese cultured pearl industry, which uses bits cut from the mussel shells as cores for pearls, has brought high prices in recent years, and this has encouraged heavier mussel fishing. The States are moving to meet the problem with limits on harvesting. Tennessee already has passed a licensing and control law, and Alabama and Kentucky agencies are considering similar regulations.

TVA biologists using a sampling dredge and SCUBA diving equipment examined over 500 miles of Tennessee River bed, from Watts Bar Dam in east Tennessee to the river's mouth. The examinations showed that in most cases areas which formerly were productive mussel beds now have only a fraction of the mussels there in past years.

Little evidence has been found to indicate water pollution or disease as causes of the decline, although the more valuable mussel species will not tolerate the thin film of silt that now covers much of the old river bottom.

The best Tennessee River mussel beds now are in areas downstream from the dams where there is enough current to keep the river bottom clean. Over 175 miles of river channel is still good habitat for the preferred commercial mussel species, and overharvesting is considered the main cause of the population decline in those areas.

Copies of the progress report on the mussel study are available from TVA and from State conservation agencies. A detailed report will be published in January 1966. Meanwhile, a TVA biologist will continue some aspects of the study. More work will be done on the possible effects of changes in fish populations (a young mussel spends part of its life cycle as a parasite on certain fish), on water quality, and on possible disease or parasite infestation. (Tennessee Valley Authority, May 6, 1965.)

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

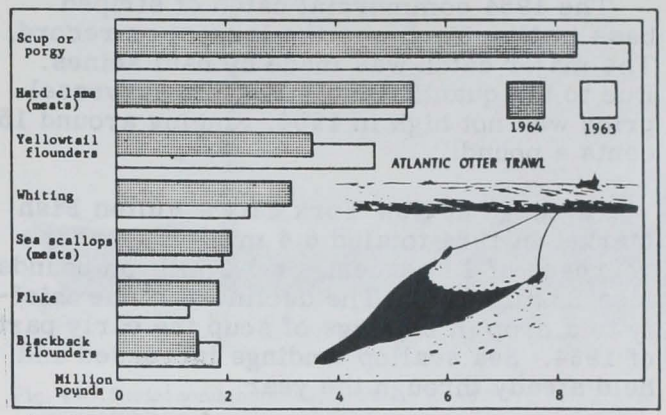
New York

FISHERY LANDINGS, 1964:

Total landings of fish and shellfish in the Marine District of New York during 1964, exclusive of unclassified fish for reduction, were 79.2 million pounds valued at $9.9 million ex-vessel. Compared with 1963, that was a decrease of 38 percent in quantity, but an increase of 7 percent in value. Lighter landings of menhaden, scup, and yellowtail and blackback flounders accounted for most of the decline in finfish landings. Shellfish, with the exception of oysters, showed an increase, with total landings up 11 percent in quantity and 9 percent in value. In terms of total value, shellfish ($6.8 million) exceeded the value of all finfish by $3.8 million.

The 1964 catch of menhaden was down 54 percent from 1963. The menhaden fishery was at its lowest ebb in many years. The industrial fishery for species other than menhaden has developed into a large-scale operation, compensating in part for the short supply of menhaden.

Lighter landings of scup or porgy (down nearly 1 million pounds from 1963) were the result of reduced catches by otter trawls. Because of the short supply, prices remained high and the total ex-vessel value of the species in 1964 was equal to that of the previous year.



New York State marine catch of certain fish and shellfish, 1964 and 1963.

The pound-net fisheries showed improvement only in the catch of scup. It was generally a poor season. The fishing effort in Raritan Bay has declined steadily due to poor fishing and is expected to decrease further.

New York Marine Landings, 1964 and 1963

Species	1964		1963 1/	
Finfish:	Pounds	Value	Pounds	Value
Bluefish	675,115	109,426	696,750	102,295
Butterfish	1,066,655	126,161	1,151,041	147,966
Flounders: Gray sole	516,500	72,220	882,200	137,659
Blackback	14,620	2,072	9,200	1,140
Yellowtail	1,440,640	74,031	1,842,525	98,483
Fluke	3,561,810	233,403	4,668,675	287,940
Unclassified	1,853,780	445,448	1,305,865	368,564
Menhaden	900	45	400	16
Scup or porgy	42,424,700	516,226	91,650,540	1,013,680
Striped bass	8,343,820	783,648	9,307,715	783,613
Weakfish	500,740	95,821	576,360	108,664
Yellow bass	965,500	138,439	626,100	94,061
Whiting	3,123,200	159,323	2,367,660	111,415
Unclassified fish	3,198,340	260,785	3,193,670	244,349
Total Fish	67,686,320	3,017,048	118,285,651	3,499,845
Shellfish:				
Clams, Northern	546,715	305,747	380,055	210,204
Hard	5,402,292	4,135,545	5,311,032	3,581,797
Razor	5,856	1,464	8,432	2,257
Soft	180,832	55,677	98,592	27,527
Surf	1,217,676	108,852	974,304	90,524
[illegible]	40,950	7,989	22,320	4,797
Crabs, Sea	124,950	16,512	74,340	10,604
[illegible]	213,468	315,037	394,468	572,688
Oysters: Bay	687,096	731,474	302,374	291,676
Sea	2,044,332	1,114,682	1,924,371	894,620
[illegible]	1,007,130	74,008	872,120	67,825
Total Shellfish	11,471,297	6,866,987	10,362,408	5,754,519
Grand Total	79,157,617	9,884,035	128,648,059	9,254,364

Revised. In addition to the catch in the Marine District there was a catch, principally shad, in the Hudson River District in 1963 totaling 250,000 pounds valued at $27,000.

1/ Does not include the catch of unclassified fish for reduction. Univalve and bivalve mollusks are reported in pounds of meats. Other species are shown in round weight.

The 1964 commercial catch of striped bass in New York was the largest on record. The major catch was made by haul seines. Due to the quantity available, the ex-vessel price was not high in 1964, ranging around 15 cents a pound.

Landings at New York City's Fulton Fish Market in 1964 totaled 6.4 million pounds, a decrease of 16 percent, or 1.2 million pounds less than in 1963. The decline was due chiefly to a drop in landings of scup the early part of 1964. Sea scallop landings increased and held steady through the year.

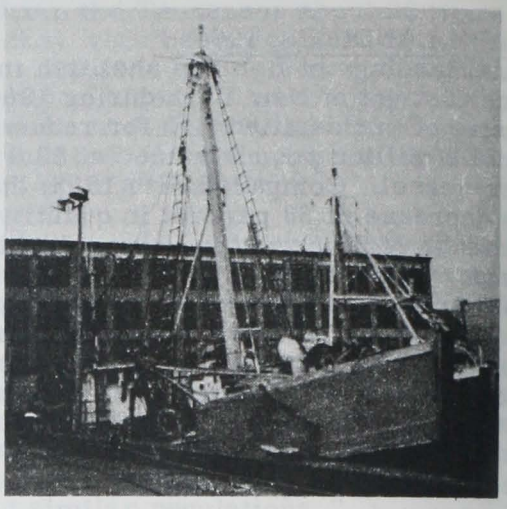
Hard clam production increased slightly in quantity and 15 percent in value as compared with 1963. There was an increase in the catch by dredges and a decline in the catch by other gear. Oyster production continued to decline with prospects for immediate improvement doubtful. In-the-shell oysters for the half-shell trade sold at very high prices, ranging from $11-$15 a bushel. The bay scallop harvest came back strong after a very poor start.

* * * * *

NEW SITE FOR WHOLESALE NEW YORK CITY FISH MARKET APPROVED:

The Site Selection Board of New York City on April 26, 1965, gave its unanimous approval to the City's acquisition of 100 acres of land in the Hunts Point section of the Bronx, contiguous to the 126-acre New York City Produce Terminal, for the establishment of a wholesale fish and a wholesale meat market. The combined produce, meat, and fish sections of that facility will form the world's largest perishable food distribution center.

The proposed fish and meat markets will be designed to house the fish dealers located in the existing Fulton Fish Market and the wholesale butchers in the present 14th Street, Brook Avenue and Harlem Meat Markets in modern quarters with truck loading platforms and direct rail connections. The new facility is planned to have 300-foot wide market streets to eliminate traffic congestion and will be provided with ample parking space. During the planning period, the consultants will work closely with the dealers to include all desirable features to make the new wholesale market facility the most efficient possible.



Gloucester trawler Manuel P. Domingos docked in New York City's Fulton Fish Market. In the background is the "Old Shed," the older of two sheds used to sell and handle the salt-water fish received by truck, rail, and steamship from all over the world.

Note: See Commercial Fisheries Review, November 1964 p.

North Atlantic

SOVIET FISHING ACTIVITY OFF COAST, MAY 1965:

A total of 57 Soviet vessels was observ in the North Atlantic during the early part May 1965 when an aerial reconnaissance flight was made to observe foreign fishing activity. The vessels sighted were identi

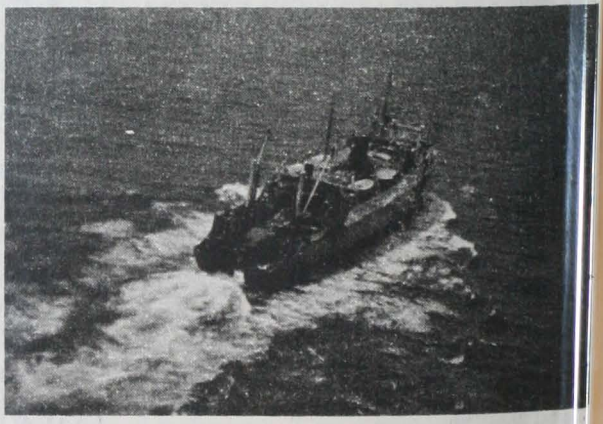
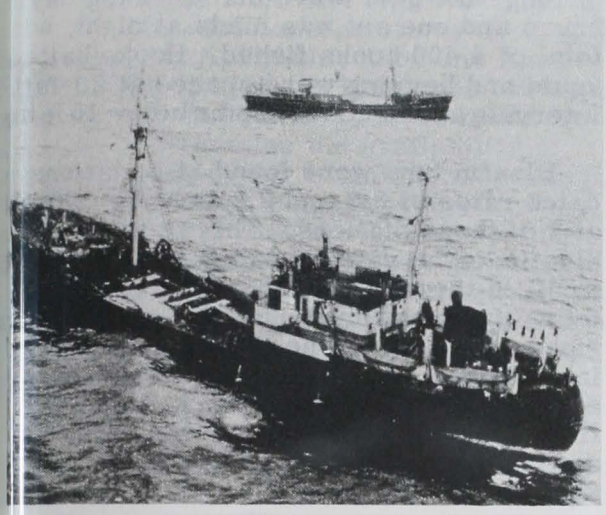


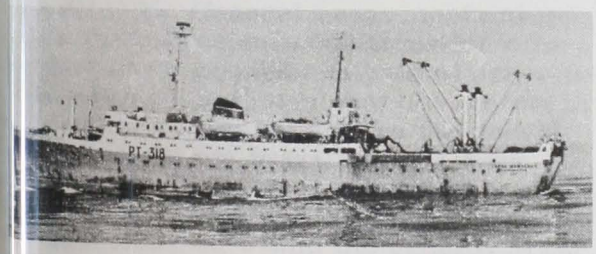
Fig. 1 - Soviet factoryship stern trawler of 300 feet, fishing northern edge of Georges Bank in the North Atlantic.



2 - In the foreground, a 500-ton Soviet side-fishing trawler op-ting in the Grand Banks area of the North Atlantic.

12 factoryship stern trawlers, 27 side trawl-, 7 refrigerated fish transports, and 1 tug. hing operations were widely scattered over 00-mile area from south of Nantucket Is-d to the southwest part of Georges Bank eanographer Canyon), with the heaviest sel concentration at the latter position.

Soviet vessels fishing areas south and theast of Nantucket Island about early May re taking substantial quantities of red hake lesser amounts of whiting. The main up of vessels on Georges Bank were catch-herring mostly, and some whiting. Reduc-h plants on several of the stern trawlers re in operation.



3 - Maiakovskii class Soviet factoryship stern trawler in the North ntic. Equipped to freeze, can, and process fish meal and oil.

uring a reconnaissance flight about mid-th, 19 Soviet vessels were sighted--4 fac-ship stern trawlers, 11 side trawlers, 3 gerated transports, and 1 tanker. The covered started south of Nantucket Is-and included the area between Atlantis on and Corsair Canyon along the 100-

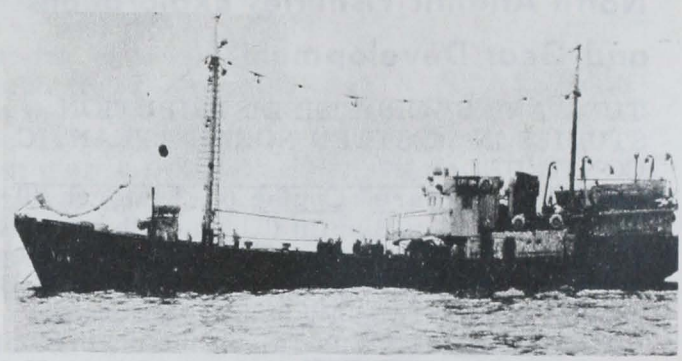


Fig. 4 - A Soviet combination-type 145-foot vessel capable of drift gill-net fishing or trawling. Herring catches are salted in barrels and later transferred to a mothership.

fathom contour. Vessels were fishing and catches appeared to be spotty, consisting mostly of herring.

On another flight toward the end of the month, 20 Soviet vessels were spotted and identified as 16 side trawlers, 1 factoryship stern trawler, and 3 support vessels. None was fishing. Most of them appeared to be either transferring or waiting to transfer their catches. This flight covered the Continental Shelf area northeastward a distance of 90 miles, and the south and western portion of Georges Bank. Visibility was very poor because of fog.

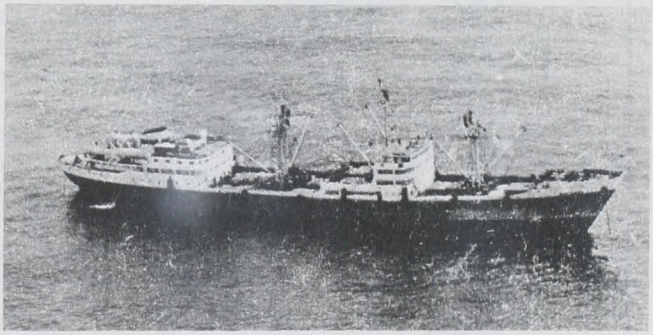


Fig. 5 - Refrigerated fish transport used by Soviets in North Atlantic fishery to transport fishing vessel catches to the U.S.S.R.

These observations were made by the staff of the Fisheries Resource Management Office, U. S. Bureau of Commercial Fisheries, Gloucester, Mass. Weekly reconnaissance flights are made in cooperation with the U. S. Coast Guard.

Note: See Commercial Fisheries Review, June 1965 p. 27.

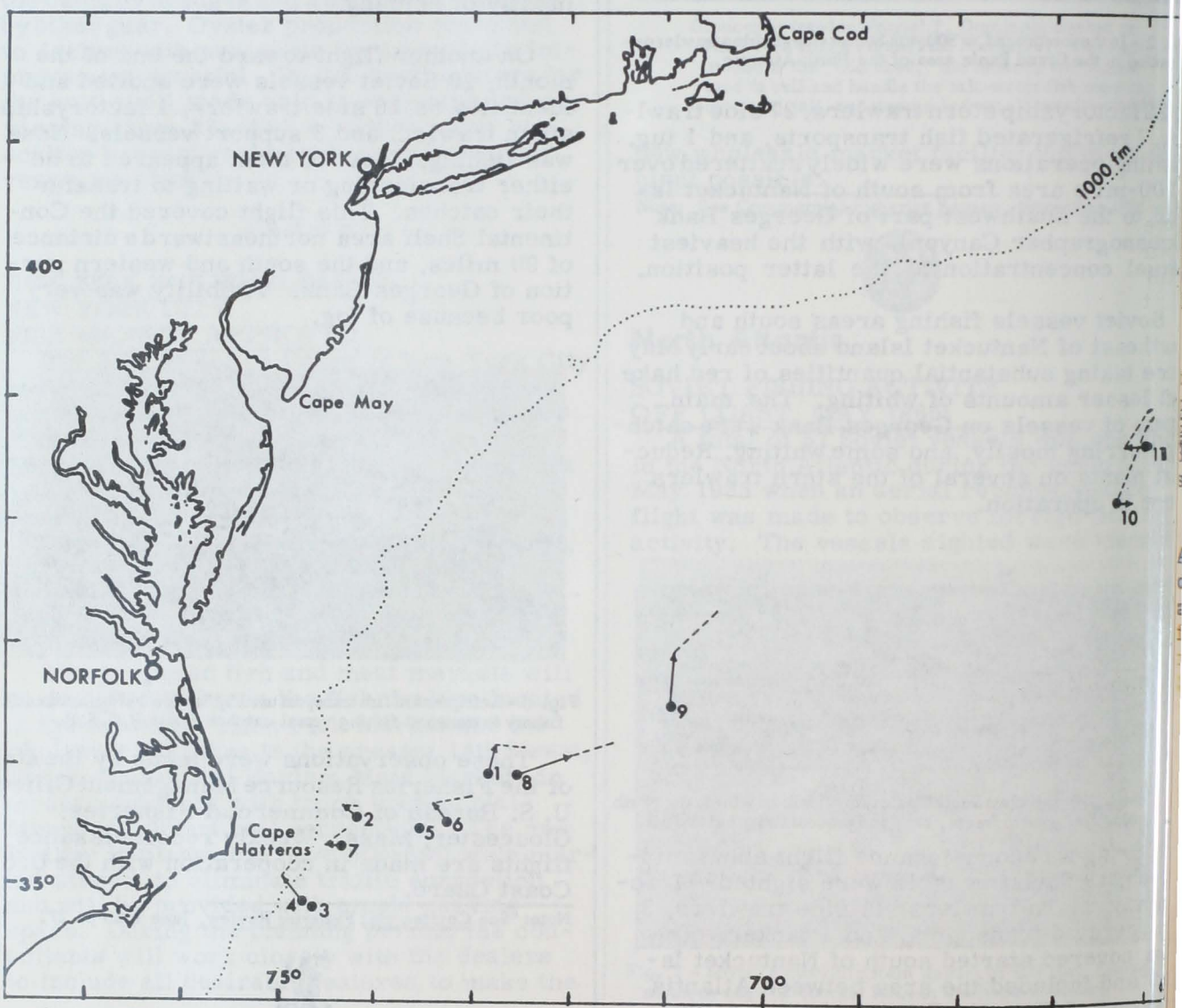
North Atlantic Fisheries Explorations and Gear Development

TUNA AND SWORDFISH DISTRIBUTION STUDIES IN WESTERN NORTH ATLANTIC CONTINUED:

M/V "Delaware" Cruise 65-3 (March 30-April 23, 1965): Bluefin (Thunnus thynnus) and yellowfin tuna (Thunnus albacares) were caught during long-line investigations by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware along the north frontal edges of the Gulf Stream east of Cape Hatteras. The two-part cruise was designed principally to survey tuna distribution and abundance in areas which had not been previously investigated at that time of year.

LONG-LINE SETS AND CATCH: Eight se of long-line gear were made during dayligh hours and one set was made at night, with total of 4,400 hooks fished. Hooks baited w squid and herring were spaced at 20-fathor intervals and fished at depths below 15 fathor

Bluefin tuna were found at 5 stations wi catch rates of 3.3 and 3.2 fish per 100 hoo at 2 of those stations. This is the highest bluefin catch rate recorded for the month April in the area fished and is evidence tha more than scattered numbers of this speci may be available in the area of the Gulf Strea immediately adjacent to Cape Hatteras dur early spring. Average round weight of blu fin taken during the cruise was 245 pounds and the weight range was 173-372 pounds.



Shows station pattern of M/V Delaware Cruise 65-3 (March 30-April 23, 1965). Drift of long-line sets is shown by dashed line

Previous long-line catch data for yellowfin tuna in that region from late April through May indicated substantial concentrations (M/V Delaware cruises in April-May 1960 and April-June 1964) when up to 14 and 19 fish per 100 hooks were recorded. Special effort was made on this cruise to determine the availability of such abundances earlier in the month of April. Results of the survey suggest yellowfin were entering the area at that time. The species was taken at 5 stations, with the highest catch rate of 3.8 fish per 100 hooks at the station worked on April 15. The average round weight of yellowfin tuna on the cruise was 85 pounds and the weight range was 33-149 pounds.

Albacore tuna (Thunnus alalunga) were found in very small numbers at 5 stations, with the highest catch rate 1.0 fish per 100 hooks at one of those stations. The average round weight of albacore tuna was 45 pounds, and the weight range was 37-55 pounds. Two skipjack (Euthynnus pelamis) tuna weighing 34 and 15 pounds were taken, 1 at each of 2 stations worked. They were the first skipjack taken earlier than May north of Cape Hatteras. A single bigeyed tuna (Thunnus obesus), estimated weight 100 pounds, was taken at one station and a single swordfish (Xiphias gladius) of 75 pounds was caught at the only night long-line station worked.

Other incidental long-line catches during the cruise were: 1 longbill spearfish (Tetrapturus pfluegeri), 1 blue marlin (Makaira nigricans), 6 white marlin (Tetrapturus albidus), 3 wahoo (Acanthocybium solanderi), and 1 shortail mola (Mola lanceolatus).

ENVIRONMENTAL DATA VS. TUNA AVAILABILITY: General areas containing desirable environmental conditions for tuna availability were through analysis of sea surface temperature isotherm charts received by radiofacsimile equipment aboard the vessel. Specific locations for long-line sets were determined on the basis of supplementary surface and vertical (subsurface) temperature probe data obtained within the general area. All sets were positioned in relation to cold/warm water interfaces (steep horizontal thermal gradients) associated with the frontal edges of the Gulf Stream.

A total of 7 sets as made toward or across these interfaces to determine tuna availability with the general temperature gradient structure. Results at those stations indicated that tuna were associated with the mixed surface layer on the warmer side of the interfaces. Two sets at 2 separate stations were positioned, based on information from the other sets, in the warmer water and about parallel to the interface. Those 2 sets not only yielded the highest tuna catches of the cruise, but their comparative catch composition indicated displacement of bluefin concentrations by yellowfin concentrations over a one-week period (April 8-15).

MODIFICATIONS TO LONG-LINE DECK GEAR: Several modifications to long-line gear-handling equipment on the deck of the vessel were indicated during an earlier cruise of the Delaware in October-November 1964. For this cruise in April 1965, a redesigned long-line reel was constructed with a heavier frame, a larger core with increased length, a heavier automatic levelwind, an auxiliary hydraulic control near the reel, and an automatic braking device. After minor adjustments and a normal break-in period, the system functioned smoothly. An improved branchline tub, designed to reduce snarls and ease branchline handling during setout, was given initial trials. Further separation of branchline coils and baited hooks in the tubs was indicated.

OTHER ACCOMPLISHMENTS AND OBSERVATIONS: With few exceptions, all viable tuna, marlin, and shark caught on long-line gear were marked with dart-type tags and released. In cooperation with the tagging program of the Woods Hole Oceanographic Institution, Woods Hole, Mass., 28 bluefin tuna, 16 yellowfin, 1 albacore, 1 big-eyed, and 2 white marlin were released. A total of 51 shark of assorted species was released for the Shark Research Panel of the American Institute of Biological Sciences. Stomachs and gonads from 40 tuna were frozen for analysis at the Bureau's Biological Laboratory, Washington, D. C. Night light-dip net collections were made at 2 stations and a single unproductive trolling transect at the end of one station was made when what appeared to be yellowfin tuna were observed breaking the surface. Five plankton tows were made, 3 during haulback of long-line sets, with an experimental surface net from the Woods Hole Oceanographic Institution which samples the top ten centimeters at the surface. Included in the catches were 3 larval swordfish taken at 3 stations.

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

North Atlantic Fisheries Investigations

WINTER DISTRIBUTION AND ABUNDANCE OF GROUNDFISH SPECIES STUDIED: M/V "Albatross IV" Cruise 65-2; Part I (February 1-15, 1965), Part II (February 26-March 2): To determine the winter distribu-

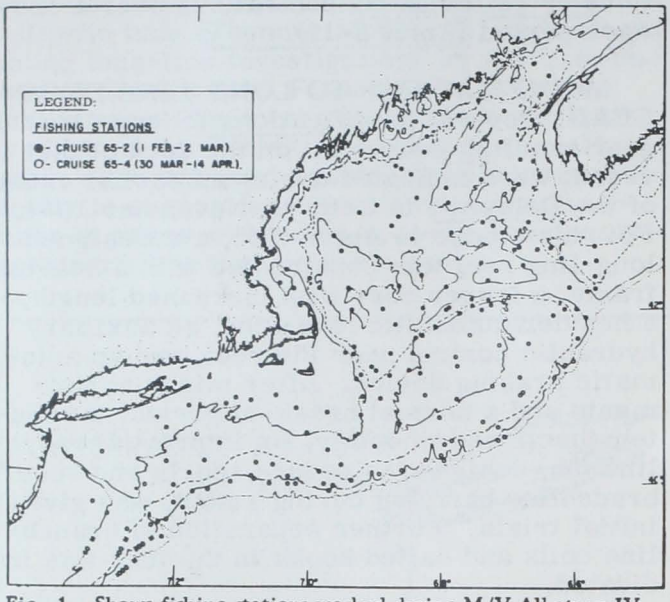


Fig. 1 - Shows fishing stations worked during M/V Albatross IV 1965 winter groundfish survey.

tion and relative abundance of groundfish species from the Bay of Fundy southward to Hudson Canyon was the objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV. All survey stations were not occupied as planned because of difficulties encountered, but those from the Bay of Fundy southward (including Browns Bank) to the Northern Edge of Georges Bank were surveyed. The remaining stations were surveyed on a later cruise.

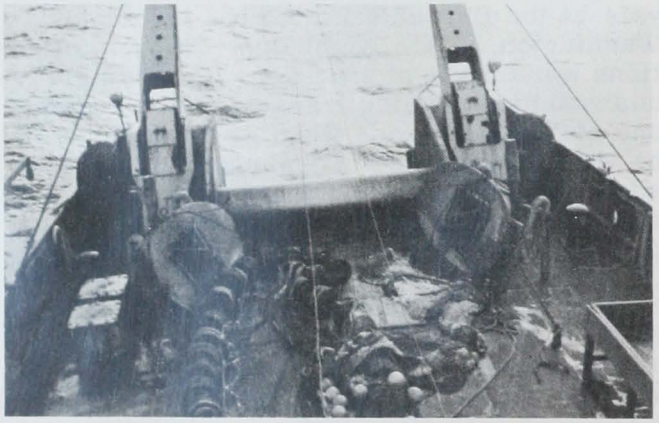


Fig. 2 - Fishing deck of M/V Albatross IV showing otter trawl and doors.

Ocean perch were caught in the deep wa off Cape Cod and at several locations in t Gulf of Maine; haddock were caught arou Nova Scotia and on Georges Bank. A lar catch of good marketable sizes of blackb flounder was taken off St. Mary's Bay, No Scotia. Moderate quantities of cod were caught on Stellwagen Bank and in the Sou Channel, and spiny dogfish were taken in deep water off the Northern Edge of Geo Bank.

All fish caught during the cruise wer identified and measured and the total we by species was obtained for each tow. S ach contents from a variety of species w examined and recorded, and scale samp were taken from yellowtail flounder and dock. Otoliths were obtained from silve and white hake. A sample of the bottom was obtained at each station. Invertebr caught in each tow were preserved for s

* * * * *

M/V "Albatross IV" Cruise 65-4, Pa (March 30-April 8, 1965); Part II (April The first phase of this cruise, which wa ducted in two parts, was partly a continu of the Bureau's research vessel Albatro Cruise 65-2 to survey the area from Hu Canyon to the Northern Edge of Georges

Relatively few fish were caught on th southern part from Hudson Canyon to Ge Bank during the first phase of this cruis One large catch of dogfish (12,000 pound was made in 88 fathoms off southern Ne England. On the western side of Nantuc over 800 pounds of ocean pout were cau shoal water, and on Georges Bank sever good catches of haddock were made in t shoal water.

All fish caught on this cruise were i fied and measured. The total weight by cies was obtained for each tow, and sto contents from a variety of species wer amined and recorded. Scale samples w taken from yellowtail flounder and had Otoliths were extracted from silver ha hake, and white hake. A sample of the type was obtained at each station. Inve brates caught in each tow were preser study and samples of sea herring were ted for laboratory studies.

During the cruise tows were made a eral depths with the Isaac--Kidd midwa

twl in an area about 160 fathoms deep off the Northern Edge of Georges Bank. The gear was towed at 5 knots and probably did not exed 70 fathoms in depth. Adult whiting (silver hake) and shrimp were caught in each tow.

Part II of this cruise was a continuation of a earlier special sampling cruise in January 65, designed to determine effect of tow duion, speed, and distance trawled on size a variability of catches. Trawling was conted in the same area (southeast part of rges Bank) as previously, using the same tage sample design, and the same gear (No. trawl with liner in cod end--the "standard" sus trawl).

Five stations were completed with 10 tows ach station (2 tows each lasting $7\frac{1}{2}$, 15, 30, and 120 minutes). The catch (or aliquot ple) of each species was weighed and sured for each tow. Bathythermograph casts were made while steaming, and t every 6 hours while on station.

During this part of the cruise an odometer attached to the foot rope of the trawl as he January cruise, and number of turns rded after each tow. At 2 stations and a few tows at 2 other stations, a buoy with r reflectors was anchored. Speed and ance trawled were determined by recordbearings and ranges of buoy during indial tows. Rough seas prevented extensive of the buoys and 1 buoy was lost.

ut of 71 mature female haddock taken on cruise and examined, 26 percent were not ripe, 30 percent were ripe or partly spent, 44 percent were spent. It was believed spawning may have been somewhat later normal this year.

See Commercial Fisheries Review, May 1965 p. 26; 1965 p. 44.

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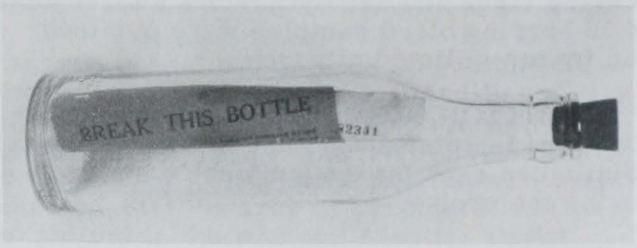
INENTAL SHELF WATERS SURVEYED: V "Albatross IV" Cruise 65-3 (March 1965): To conduct an environmental y of Continental Shelf waters in an area ed by longitudes 63° W. and 73° W. was urpose of this cruise by the research el Albatross IV. The survey included the ction of data on the vertical and horizonistribution of temperature, salinity, oxyand chlorophyll.

total of 87 hydrographic stations was ocd throughout the survey area and 157 thermograph (BT) lowerings were made



Type of drift bottle released at hydrographic stations.

to determine temperatures. Water samples were obtained at 11 different depths ranging from 1 to 250 meters (3.3 to 820 feet) to determine salinity, oxygen, and chlorophyll. During the cruise, 6 sea-bed drifters and 6 drift bottles were released at alternative hydrographic stations.

Note: See Commercial Fisheries Review, February 1965 p. 35.

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LOBSTER AND SEA HERRING POPULATIONS AND LARVAE STUDIED: M/V "Albatross IV" Cruise 65-5 (April 21-30, 1965): Lobster and herring investigations were conducted during this cruise in the North Atlantic Ocean (general area of Georges Bank) by the research vessel Albatross IV. The objectives were to: (1) sample populations of lobsters and sea herring and obtain related environmental data, (2) obtain lobster and sea herring blood samples, and (3) make plankton tows for lobster and herring larvae.

FISHING OPERATIONS: Lobster: A total of 24 trawl sets was made at the 10 lobster stations worked during this cruise. The sets made in waters ranging in depth from 58 to 170 fathoms yielded 272 lobsters, 140 females and 132 males. Thirty-two of the females were berried. Only one of all the lobsters caught (a female) was soft-shelled. The mean weight of the catch was 4 pounds, the range in weight was from 1 to 22 pounds. Morphometric measurements (17) were made on each of 200 lobsters, and 54 blood samples were obtained.

Herring: Six herring trawl sets were made at the 6 stations covered. The sets (1-hour duration) made in waters of 28 to 44 fathoms yielded a total of $5\frac{1}{4}$ bushels of fish. The herring were caught primarily in the southwest and southeast part of the Banks, with only a few taken at 3 of the stations worked. The herring were from 12.0 to 32.5 centimeters (4.7 to 12.7 inches) long. The 1960 year-class was dominant in the catches, followed in percentage occurrence by sardine-size

herring (1962 and 1963 year-classes). A total of 50 herring blood samples were obtained and frozen in liquid nitrogen.

PLANKTON OPERATIONS: Lobster: Thirteen 1-meter net plankton tows, lasting 15 minutes each (at the surface) were made during the cruise.

Herring: A total of 26 1-meter net plankton tows each lasting 15 minutes (5 minutes each at depths of 32.5 feet and 4.7 feet, and 5 minutes at the surface) was made during the cruise. A total of 452 larvae with a mean length of 38 millimeters of 1.5 inches (range 27 to 52 millimeters or 1.1 to 2.0 inches) was obtained.

High-speed plankton sampler is hauled in and samples transferred to glass jar.

HYDROGRAPHIC OBSERVATIONS: During the cruise, 5 sea-bed drifters and 5 drift bottles were released at each of the plankton tow stations. At each station, bathythermograph (BT) casts were made; surface, mid-depth, and bottom salinity samples collected; and weather observations recorded. Surface and bottom temperatures were taken and recorded at lobster and herring stations worked.

The Albatross IV was scheduled to leave her home port at Woods Hole, Mass., on May 5 to conduct a survey of the sea scallop grounds on the eastern part of Georges Bank.

Note: See Commercial Fisheries Review, May 1965 pp. 25 and 26.

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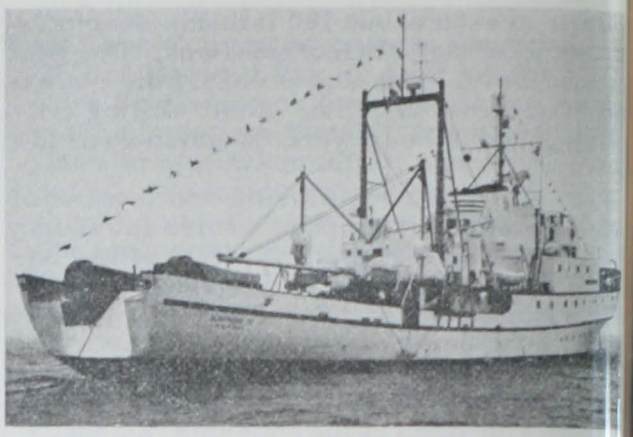
SEA SCALLOP POPULATION SURVEY ON GEORGES BANK CONTINUED:

M/V "Albatross IV" Cruise 65-6 (May 3-13, 1965): To collect data on the distribution and abundance of sea scallops on the major scallop grounds of Georges Bank and to obtain samples of bottom invertebrates was the purpose of this 9-day cruise by the research vessel Albatross IV.



The U. S. Bureau of Commercial Fisheries research vessel Albatross IV.

A total of 194 tows was made at 192 sta tions with a 10-foot standard sea scallop dredge with a 2-inch ring bag. Hydrograph operations consisted of 212 bathythermog (BT) casts made at each station worked a at hourly intervals while steaming to and from Georges Bank. About 100 live sea s lops were brought back for study at the Bu reau's Biological Laboratory at Woods Ho Mass.

Note: See Commercial Fisheries Review, December 1964 p.

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BARNACLE LARVAE IN GULF OF MAINE AND RELATION TO SARDINE FEED:

Several biological research cruises to termine the abundance and distribution of barnacle larvae and other planktonic orga nisms along the Maine coast were conduct earlier this year by research vessels ope ated by the U. S. Bureau of Commercial F eries Biological Laboratory, Boothbay Ha bor, Me. This short article documents th results of those cruises and relate the fi ings to the type and amount of feed found sardine stomachs during the period.

The first cruises with the Bureau's re search vessel Phalarope II in the areas Boothbay Harbor, Pemaquid and Tenants bor, showed that the waters were domina by barnacle larvae in early stages of dev opment. All plankton samples were betw 75-90 percent barnacle larvae. The grea abundance occurred in the bays and decr in the offshore areas (2 miles out). The cruises in those areas showed less differ between inshore and offshore waters and reduction of barnacle larvae by nearly 50 cent. In addition, the larvae were in late

es of development and were concentrated epths between 2 to 15 fathoms. The greatest bers occurred at a depth of 5 fathoms. se results showed that the peak swarming e western area had passed and that it ld continue to subside.

nother cruise was made in early April by the research vessel Rorqual to com- the plankton in eastern and western wa- The samples from areas west of Penob Bay were dominated by barnacle larvae, samples tallying 80 percent of that spe- In the area of Isle au Haut, the total kton volumes were much lower and only rcent were barnacle larvae. Samples Passamaquoddy Bay and in the vicinity Wolves showed less than 2 percent bar- larvae and red feed (copepods) domina- e samples. This information, together records from past years, suggests that warming of barnacle larvae in eastern s may not occur until May.

examination of sardine stomachs cor- rated the Bureau scientists' findings on me of barnacle swarming. Fish taken Pemaquid in early March contained no cle larvae and were generally free of By late March, some of the samples of were 90 percent feedy with barnacle lar- whereas other samples were entirely free d. Samples during the first two weeks ril also varied considerably, but in those hat were feedy, barnacle larvae domina- e feed. Samples from eastern waters had no cle larvae and were generally less feedy.

the sea water temperatures continue ng, other plankton organisms were ex- to increase in number and to reach stages. Feedy sardines can be expect- ccur coincident with those blooms, al- with warmer temperatures, the meta- ate will increase and clearing time will be an in the winter and early spring months.

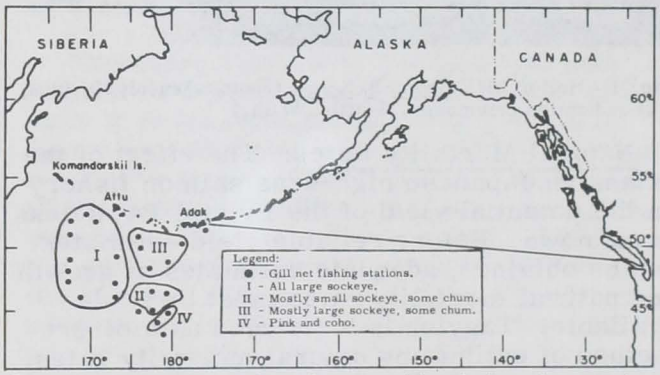
Note: See Commercial Fisheries Review, May 1965 pp. 25 and 26.

Pacific Fisheries Investigations

R 1965 SALMON RESEARCH CRUISE STERN NORTH PACIFIC BY RCH VESSEL "GEORGE B. KELEZ":

wo-month salmon research cruise in the n North Pacific Ocean by the U. S. Bu- f Commercial Fisheries research ves- sel George B. Kelez was completed on March 28, 1965. Earlier cruises by the Bureau's research vessel have shown large concentrations of immature salmon (primarily sockeye and chum) to be close to the south side of the Aleutian chain during summer. Results of the George B. Kelez fall 1964 cruise, however, indicated that the area of greatest abundance had shifted to the western Aleutian region. The winter 1965 cruise was designed to trace the salmon migration during winter by gill-net fishing in the same general area fished during the fall of 1964, according to the Bureau's Biological Laboratory, Seattle, Wash.

A total of 24 gill-net sets were made between Adak Island and the Kommandorski Islands, and south to 43° N. The total of about 1,300 fathoms of surface gill nets with mesh sizes ranging from 2 to 5¼ inches (stretched measure), took 598 sockeye, chum, pink, and coho salmon. The northern and western portions of the area fished yielded mostly large and probably maturing sockeye salmon; a "band" of immature, 1-winter-at-sea, sockeye was found near 46.5° N., and pink and coho salmon (but no sockeye) were caught south of 45° N. Chum salmon were taken in small but consistent numbers throughout the eastern half of the cruise. The southern limit of winter salmon distribution in that area appears to be near 43° N., where only one chum salmon was collected (chart).



Shows fishing stations and catch composition during winter cruise of research vessel George B. Kelez.

Four experimental deep nets, which fished from the surface to a depth of 72 feet, were tried at several stations to investigate vertical salmon distribution. Only three salmon were taken deeper than 24 feet.

Note: See Commercial Fisheries Review, April 1965 p. 28; January 1965 p. 46.

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SALMON MORTALITY AND GILL-NET DROPOUT STUDIES IN EASTERN ALEUTIAN AREA:

Three research vessels of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Seattle, Wash., were scheduled to leave for the eastern Aleutian area in May 1965 where they were to conduct biological studies on salmon. The research vessels are the George B. Kelez, and the two chartered vessels Yaquina and the Paragon.

The primary objectives of the cruises are to: (1) study mortality of Bristol Bay salmon during their last 6 weeks of ocean life, and (2) determine the magnitude of salmon dropouts from high-seas gill nets.

Fig. 1 - Hull of M/V George B. Kelez. (Photo taken July 20, 1962, at dedication ceremonies, Seattle, Wash.)

Natural Mortality Rates: The effect of the extensive Japanese high-seas salmon fishery on the potential yield of the Bristol Bay stocks is unknown. Before reliable yield estimates can be obtained, adequate estimates of growth and natural mortality rates must be made available. Tagging is to be used as a direct method of estimating natural mortality rates. The George B. Kelez was to long line and gill net, and the Yaquina was to purse seine to provide fish for tagging purposes. Tagging operations were to start about June 5 south of Umnak Island in the Aleutian Chain, and were to terminate just outside the Bristol Bay fishery about July 5. Most salmon were to be tagged with Petersen disc tags, but some with the "spaghetti"-type tag in an attempt to measure gill-net selectivity for the disc tag. The assignment of a physiologist on board the George B. Kelez was to attempt to assess tagging mortality and apply holding oxygen tre ments as possible means of reducing such mortality.

Fig. 2 - Salmon being tagged on the high seas to obtain inform tion on growth rates, mortality, and migration during ocean lif

Gill Net Dropouts: In a concurrent stud the vessels Paragon and the Kelez were to fish special strings of gill nets to determi salmon dropout rates (salmon caught in gil nets, but not landed). It is not known what percentage of salmon escape from high-sea gill nets, or what percentage of salmon tha escape from nets may perish before reach the inshore fishery or the spawning stream The gill nets were to be fished for varying periods of time throughout the night and th catches compared for nets fished for long periods versus the cumulative catch of net fished during shorter time intervals. The gill nets fished for the dropout study were to also provide some fish for tagging.

Oceanography

NEW ORGANIZATION WORKS TO DEVELOP SOUTHERN NEW ENGLAND AS A MARINE RESEARCH CENTER:

A group seeking to further develop southe New England as a national center for mar research has formed the Southern New En land Marine Sciences Association (SNEMS The new organization was announced May 1965, by the president of the University o Rhode Island. He said SNEMSA could hel bring ocean-oriented industries and resea groups to the area and also strengthen exi

in firms. "The result," he added, "would be more jobs and a healthier economy."

Explaining the need for the new organization, he said, "Most of the ingredients for a strong scientific complex--marine-based industries, federal research laboratories, and graduate programs in oceanography and engineering--are already here, but we have lacked a rallying point and a focal point for leadership which, I believe, this organization can provide."

One of the first projects of SNEMSA will be an economic inventory of the people, facilities, and other resources within southern New England. The inventory will be made by the chairman of the University of Rhode Island Department of Food and Resources Economics. He expressed enthusiasm for the project "because the area under consideration has many characteristics of an economic region that we can study and hopefully assist with some imaginative planning."

The economist pointed out that "the area has a historic association with the sea, its occupations, and its problems. It is confined in terms of natural resources to those created by the meeting of the sea with the land; that is to say: bays, harbors, fishable waters, beaches and landscapes characterized by the sea and its climate."

The dean of the University of Rhode Island Graduate School of Oceanography was elected chairman of SNEMSA at a meeting attended by some 25 individuals from seaboard organizations in Connecticut and Rhode Island. The membership includes marine scientists, businessmen, fisheries men, and administrators. Membership is on an "individual" rather than an "organizational" basis.

The objectives of SNEMSA are to: (1) foster the development of the marine sciences in southern New England; (2) develop a system of internal communication to summarize technical and general information available within the group; (3) develop a system of external communication with the public; (4) develop a system of Government liaison; and (5) provide an intellectual climate that would serve to attract scientific and technical personnel to the area. (University of Rhode Island, Kingston, R.I., May 25, 1965.)

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EDUCATIONAL GRANTS FOR 1965 AWARDED BY INTERIOR DEPARTMENT:

Graduate educational grants in oceanography have been awarded by the U. S. Department of the Interior to 18 universities as part of the National Oceanographic Program, announced Interior's Secretary Stewart L. Udall, May 17, 1965. The awards will be available for the 1965 fall semester to outstanding and deserving student scientists, who have or are about to be graduated, selected by the universities to receive one- or two-year grants.

The 1965 grants are for studies in economics, fishery technology, taxonomy (science of classification), physical and chemical oceanography, marine biology, fishery biology, ocean engineering, and biological oceanography. A total of 42 student years will be awarded, 5 years of which may be used at the discretion of the institutions to extend the grants of 5 students already participating in the program.

Grants provide for payment of tuition fees plus a living expense allowance of $3,000 annually. Married students with children receive an additional $1,000 family allowance. Students at the University of Alaska's Institute of Marine Science receive an additional 25 percent of each allowance, if both are applicable, because of the higher cost of living in Alaska.

Secretary Udall said the program was started in 1962 to assist in developing scientists in oceanographic subjects related to fisheries. The program is administered by Interior's Bureau of Commercial Fisheries which makes $200,000 available annually for the study program. Universities receiving the grants are selected by the Department of the Interior with the advice of a panel of outstanding scientists. All qualified institutions are invited to participate in the program. Grants were made to 12 universities in 1962 and to 17 in 1963 and 1964.

Students' applications for grants are submitted directly to the university of their choice. The actual number of participating students is contingent upon decisions by the universities in awarding one- or two-year grants.

Universities receiving the 1965 grants and the various fields of study are: University of Florida, economics; University of Massachu-

setts, economics and fishery technology; Oregon State University, ocean engineering, biological oceanography and fishery technology; University of Alaska (Institute of Marine Science), chemical oceanography; University of Washington, fishery technology and physical oceanography; Scripps Institution of Oceanography, physical and/or biological oceanography; The Johns Hopkins University, physical oceanography; Rutgers University, fishery technology; University of Miami (Institute of Marine Science), fishery biology and physical oceanography; University of Michigan, fishery biology; Cornell University, fishery biology; University of Rhode Island, biological oceanography; Harvard University, marine biology and ecology or biological oceanography; Duke University, marine biology and ecology; University of Hawaii, marine biology and ecology; Michigan State University (W. K. Kellogg Biological Station), limnology (study of lakes and their contents); University of Texas, taxonomy or fishery biology; University of Georgia, marine biology and ecology or fishery biology.

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

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FOURTH EXPEDITION TO GULF OF GUINEA COMPLETED BY RESEARCH VESSEL "GERONIMO":

After completing a 4-month 15,000-mile expedition to the Gulf of Guinea off West Africa, the oceanographic research vessel Geronimo, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Washington, D. C., returned to her home base at the Navy Yard Annex on May 18, 1965.

This fourth cruise of the research vessel Geronimo to West Africa during the International Cooperation Year, now being observed worldwide, was another contribution to United States participation in cooperative international studies of the tropical Atlantic Ocean. Those studies were begun in 1963 and have involved some 20 oceanographic research vessels from many nations. One of the major goals is to gain knowledge useful in increasing the supply of protein for West African countries. The Geronimo's Chief Scientist on the cruise said the vessel's latest expedition was successful in accomplishing two main objectives: (1) further measurement of a heretofore unknown ocean current in the Gulf of Guinea, and (2) confirmation of hypotheses about the distribution of tuna schools off West Africa.

During the first cruise of the vessel Geronimo to the Gulf of Guinea in 1963, the od behavior of research instruments in the wa ter below the eastward-flowing Guinea Cur rent led scientists to believe that a substan westward-flowing undercurrent existed. Or subsequent cruises, the formerly unknown Guinea Undercurrent was confirmed, and th measurement of its role in the Gulf of Guin circulation has been accomplished.

Scientists and crew aboard the Geronimo are preparing to oper cod end of a large trawl to study the organisms captured.

The wide-ranging tuna are found where their food is most abundant--generally nea the boundary between ocean water of differ ing types and origin. In February 1965 suc a boundary was found offshore from Senega to Sierra Leone, West Africa, by scientists aboard the Geronimo. As predicted, great concentrations of tuna schools were locate just to the south of that boundary.

A new oceanographic instrument, deve l ed at the University of Miami, was tested from the Geronimo on this latest cruise. When lowered into the water, it records a board ship simultaneously and continuous l the depth, temperature, salinity, and time Its use will greatly increase the speed an efficiency of data collection on future oce ographic surveys.

While on this expedition, the vessel G ronimo rendezvoused with the John E. Pil bury, the fishery and oceanographic rese vessel of the Institute of Marine Science, versity of Miami. Particular concern of joint research was a study of variations i rate of flow of the Atlantic Equatorial Un

current and changes in its north-south location.

The latest cruise of the vessel Geronimo also had other international aspects. Two French scientists of the ORSTOM Laboratory at Pointe-Noire, Republic of Congo (Brazzaville), worked aboard the Geronimo during the tuna surveys. They are studying the population dynamics of tuna off West Africa. At Monrovia, Liberia, about 20 biology students from the University of Liberia were shown the vessel's laboratories and its oceanographic equipment. Also, during a tuna survey in waters off the Republic of Ivory Coast, a one-day cruise was arranged for fishery administrators and fishery scientists, and fish processors of that nation to demonstrate various oceanographic techniques.

Note: See Commercial Fisheries Review, January 1965 p. 43.

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RESEARCH VESSEL "JOHN ELLIOTT PILLSBURY" STARTS LONG OCEANOGRAPHIC EXPEDITION:

A 23,000-mile oceanographic expedition to the Caribbean, South America, Africa, and the Mediterranean was started in March 1965 by the oceanographic research vessel John Elliott Pillsbury. The 176-foot vessel is operated by the Institute of Marine Science (IMS), University of Miami, and will be at sea about 9 months.

The vessel's itinerary and research activities on the expedition include studies of productivity and the chemistry of sea water in the Guiana basin and at the mouth of the Amazon River. Following those studies, she will cross the Atlantic at the equator, investigating surface and subsurface currents en route. On this lap of the cruise, the IMS oceanographers aboard the vessel will take part in Equalant V, an international survey of the tropical Atlantic in which scientists from 11 nations are participating. During an earlier phase of Equalant, the IMS vessel discovered an immense undersea mountain, or seamount, in the part of the Atlantic. The peak has been named Pillsbury Seamount. During Equalant V, the Institute's vessel will cooperate closely with the U. S. Bureau of Commercial Fisheries research vessel Geronimo. The Bureau's research vessel will operate out of Miami after the new U. S. Fish and Wildlife laboratory has been completed.

Along the west coast of Africa the Institute's Division of Biological Sciences will conduct an investigation of the southern part of the Gulf of Guinea, collecting fish and invertebrates from surface waters, mid-depths, and from the deep-sea floor.

Following the Gulf of Guinea studies, the John Elliott Pillsbury will then proceed north to the Straits of Gibraltar and enter the Mediterranean Sea. While in that area, a geological, geophysical, and geochemical investigation of the Mediterranean Sea and the Black Sea will be conducted for about 5½ months. Submarine volcanoes will be investigated, and studies of deep-sea sediments, currents, and bottom topography will be carried out. In the Black Sea, sometimes known as the "Kingdom of the Dead," piston-coring devices and bottom dredges will be used to sample the poisonous depths. In that body of water, there are no living organisms of any kind (except for a few bacteria) below the surface layers, and no oxygen, and consequently the bodies of surface animals that sink to the depths do not decompose in the usual manner. In the Black Sea, the vessel scientists hope to find bodies of ancient forms still intact on the bottom. There, also, are possibly ideal conditions for the formation of petroleum--about which very little is known to science.

The Institute's research vessel John Elliott Pillsbury was commissioned in July 1963, and since than has logged more than 330 days and over 50,000 miles at sea on expeditions and cruises for the Miami Institute of Marine Science. The vessel carries a crew of 22 and a scientific party of about 14. (News of Institute of Marine Science, Miami, Fla., March 5, 1965.)

Note: See Commercial Fisheries Review, September 1964 p. 34.

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RESEARCH VESSEL "EASTWARD" DEDICATED BY DUKE UNIVERSITY:

The $1.2 million research vessel Eastward was dedicated May 1, 1965, at Beaufort, N.C., by Duke University. Built under a grant from the National Science Foundation, the 117.5-foot vessel will be used by Duke University for oceanographic research in marine biology.

Speaking at the dedication ceremony, Dr. Paul M. Gross of Duke University said man must turn to the limitless resources of the sea to feed his rapidly growing numbers. Recent scientific discoveries indicate there is "enough food reserve in the ocean to take care of any imaginable population if scientists can only tap it," he said.

Fig. 1 - Duke University president officially accepts the Eastward from the National Science Foundation.

Dr. Gross also noted that the Eastward will allow scientists to study in detail the marine life and conditions off the Carolina coast. The knowledge thus gained could have important implications for the economy of the area.

Fig. 2 - Oceanographic vessel Eastward sails from the dock of the Duke Marine Laboratory in Beaufort, N. C.

At a luncheon preceding the dedication, Congressman David Henderson said the method of the "old-time coastal fisherman is as outmoded as a one-mule farmer's operation." He pointed out that "the only way the present day farmer of the sea can keep pace with this technological age is by having available to him knowledge gained by the same kind of research which has enabled today's farmer of the soil to share so bountifully in the general national prosperity."

Home port for the Eastward will be Beaufort, N.C., where the Duke Marine Laborator is located. (Office of Information Services, Duke University, Durham, N.C.)

Oregon

GOOD DOWNSTREAM PASSAGE REPORTED FOR CHINOOK SALMON YEARLINGS RELEASED DURING FLOOD EMERGENCY:

Apparently, many of the 2.2 million sprin chinook salmon yearlings released prematu ly last winter into the Middle Willamette Ri were able to pass downstream to the sea. Floods forced the emergency release above Lookout Point Dam and Dexter Dam of the yearlings from the Willamette Hatchery of the Oregon Fish Commission. (The fish wer intended for release below the dams in the spring of 1965.)

Since neither dam has provisions for pass age of fish, either downstream or upstream, it had been feared that most of the 2.2 milli yearlings--a major part of the Willamette hatchery's 3.5 million spring chinook produc tion--would be trapped in the reservoirs be- hind the dams. But water ran over the spill ways at both Lookout Point and Dexter for more than a month during and following the flood. That apparently made it possible for most of the young fish to pass downstream.

While many of the fish appear to have es caped, the Oregon Fish Commission estima that several hundred thousand of the young spring chinook could be landlocked in the re ervoirs. To give those trapped fish an opp tunity to escape, the U. S. Army Corps of E gineers agreed informally to spill water o the dams on a daily schedule in the spring 1965 if the reservoirs fill.

The 1967 and 1968 spring chinook runs include survivors of the emergency releas returning as 4- and 5-year-old spawners. During the past 4 seasons, an average of 1 percent of the chinook passing up the ladde at Willamette Falls have eventually entere the holding ponds at Dexter, indicating the portant role the Middle Willamette hatche is playing in helping to maintain the valuab Willamette spring chinook run. (Oregon Fi Commission, May 10, 1965.)

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STEELHEAD STOCKING PROGRAM:

An expanded steelhead stocking program in certain of Oregon's streams has been announced by the Oregon Fish Commission. Some 328,000 juvenile steelhead trout from Oregon hatcheries were released during late April 1965 into 4 river systems of Oregon.

When released, most of the young steelhead averaged 8 to 9 inches in length and weighed 7 or 8 to the pound--an optimum size, according to the Oregon Fish Commission. Experience has shown that steelhead of that size will make a rapid migration to the sea in the spring of the year, thereby arriving at the ocean with less mortality and in a shorter time than smaller fish. Steelhead with such a strong start should produce good returns of adult fish.

The April 1965 steelhead plant included 77,300 in the North Fork of the Klaskanine River, 55,000 in Big Creek, 156,000 in the North Santiam River, and 44,000 in the South Fork of the Yamhill River. (Oregon Fish Commission, May 7, 1965.)

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DUNGENESS CRABS MARKED WITH "SPAGHETTI" TAGS:

In the Pacific coast, some 4,000 Dungeness crabs were marked with "spaghetti" tags in the spring of 1965 by the Oregon Fish Commission. Each tag consists of red plastic tubing about 12 inches long and $\frac{1}{16}$ inch in diameter. The tag bears a number and a legend requesting that capture of the crab be reported to the Oregon Fish Commission. Information on the location and date of capture as well as the tag number should be noted in reporting marked crabs.

The Dungeness crabs were tagged by sewing the "spaghetti" tag through paired holes punched in the shell at the splitting line (along which the shell separates during the molt). With this method of attachment, the tag is retained when the crab sheds its shell during molting. Records of the Oregon Fish Commission show that tags have been retained through at least three successive molts. (Oregon Fish Commission, May 10, 1965.)

Note: See Commercial Fisheries Review, May 1962 p. 25.

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CLAM SPECIES ESPECIALLY SUITED TO BAYS AND ESTUARIES INTRODUCED ON TEST BASIS:

The possibility of introducing another species of clam into Oregon tidal waters is being evaluated by the Oregon Fish Commission.

The species being considered is the Japanese littleneck clam. Accidentally introduced into Washington State waters some years ago, apparently with a shipment of seed oysters from Japan, the "foreign" littleneck found environmental conditions to its liking and soon became an important commercial and personal use species in the Puget Sound area.

Oregon now has a native littleneck clam which occurs in rocky areas along the coast but, with few exceptions, the native variety is killed readily by exposure to fresh-water dilution of its normal salty environment. By contrast, an outstanding biological characteristic of the Japanese littleneck is its ability to tolerate fresh water. This should make it adaptable to many Oregon bays and estuaries which are subject to heavy runoff from streams during flood periods. Japanese littlenecks show a preference for rocky or gravel-mud bottoms, a type of site not generally favored by species already present in the State.

With the cooperation of the Washington State Department of Fisheries, several thousand Japanese littlenecks of various size were obtained for experimental introduction into Oregon. Some of those clams were planted in an experimental area in Yaquina Bay. Others were placed at selected spots in Tillamook and Netarts Bays. Studies will be conducted over a period of time to learn whether the new species will do well under Oregon conditions as expected. A favorable outcome could mean good news to hundreds of Oregonians who reap a harvest of fun and profit from the State's tidelands. (Oregon Fish Commission, April 29, 1965.)

Oysters

ANNUAL CONVENTION OF OYSTER INSTITUTE OF NORTH AMERICA:

The annual meeting of the Oyster Institute of North America was held June 27-July 1, 1965, in Baltimore, Md. It was the 57th an-

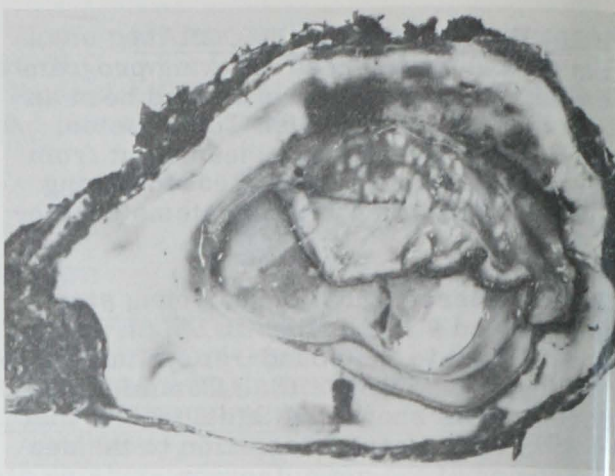
nual Oyster Convention--a joint meeting of industry's Oyster Growers and Dealers Association of North America and the technical people who are members of the National Shellfisheries Association. Represented at the annual meetings were producers, processors, distributors, and other related industry people, as well as researchers from Federal and State government agencies.

A joint session was held on hatchery and pond techniques for the pond and nursery technology of oyster and clam seed. Besides a number of outstanding speakers, there were many other prominent contributors to the knowledge of shellfish culture.

* * * * *

NEW PARASITE DISEASE UNDER STUDY:

A disease of oyster gill tissue is under study at the U. S. Bureau of Commercial Fisheries Biological Laboratory in Oxford, Md. The disease is caused by a microparasite which has been tentatively placed in the genus Sphenophrya. The organism is a ciliate found in large cysts on the gill surface of diseased oysters. Study of the parasite includes efforts to culture it in a wide variety of media and under a number of experimental conditions.

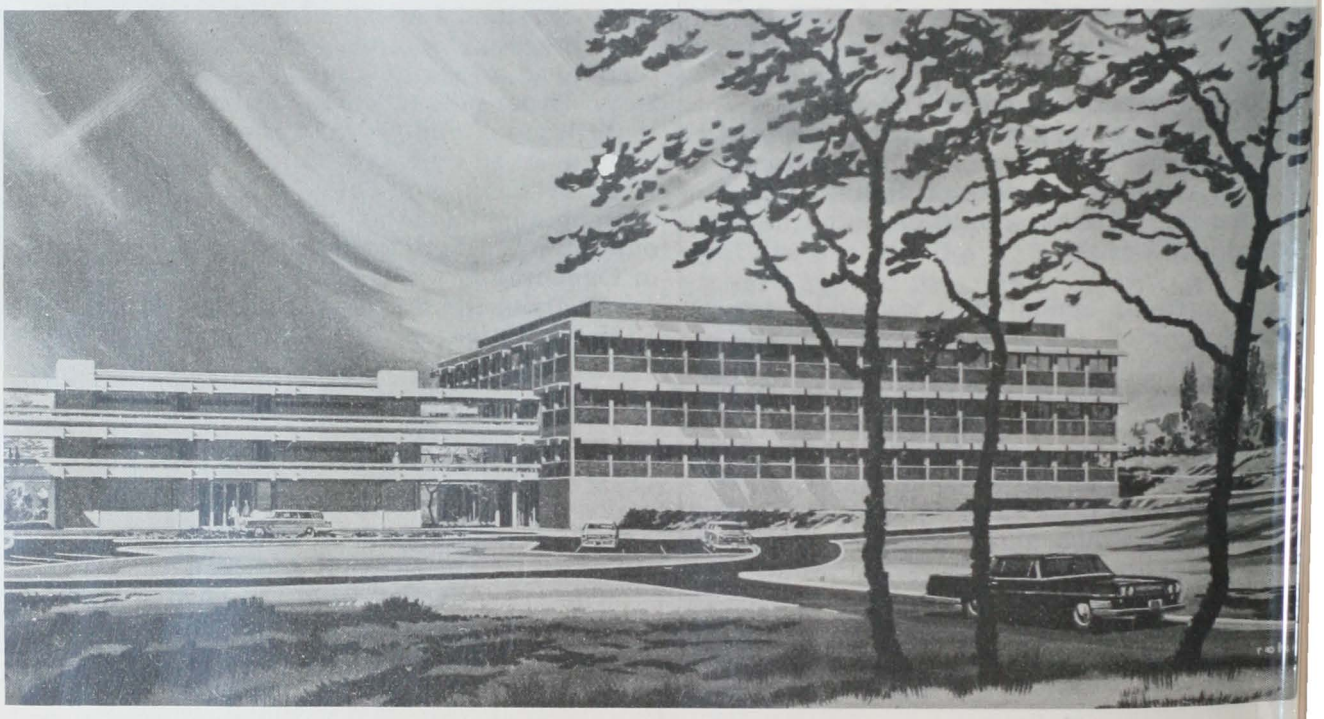


Pathological evidence of a microparasite on oyster gill tissue. Note large encysted bodies on gill surfaces and within tissue matrix. Microscopic examination of cyst contents revealed numerous ciliates to be present.

Pacific Northwest

NEW U. S. BUREAU OF COMMERCIAL FISHERIES RESEARCH LABORATORY IN SEATTLE:

The U. S. Bureau of Commercial Fisheries dedicated its new Fishery Research Laboratory in Seattle, Wash., April 19, 1965. "The facility, with all the latest scientific equipment, marks the beginning of a new era



Artist's sketch of the new Seattle Fishery Research Laboratory dedicated April 19, 1965.

biological and technological research," said Samuel J. Hutchinson, the Bureau's Regional Director for the Pacific Northwest. The new 4-story laboratory contains 65,000 square feet of floor space and will provide accommodations for 100 scientists and their support personnel.

Among projects to be conducted in the new building are research on the promising new hake industry in the Northwest and new uses for fish oil.

A feature of the new building is a water temperature control system which permits biologists to study the effect of temperatures on survival of salmon eggs, fry, and fingerlings. Such information is needed to improve fisheries.

Speaking at the dedication, Regional Director Hutchinson reviewed the growth of North Pacific fisheries research programs. These include studies of salmon, herring, and crab; technical research to find improved uses for fish and marine products; and exploratory fishing and gear research. The growing importance of those programs created the need for the new laboratory.

Senator Warren G. Magnuson gave the main address at the dedication of the new laboratory. He emphasized the problems arising out of foreign fishing in the North Pacific. In his opening remarks, Senator Magnuson said "I wish to emphasize to you today that the dedication of this building is more than a dedication of a proud structure. It is a dedication and renewed effort to properly manage, conserve, and develop our fisheries in the North Pacific. It is a dedication to protect, by whatever means necessary, these resources which have been passed to us and which we resolve to conserve for our future generations."

Salmon

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

On May 1, 1965, canners' stocks in the United States of Pacific canned salmon totaled 1,150,880 standard cases (48 1-lb. cans), 284,865 cases less than on April 1, 1965, when stocks were 530,442 cases less than on March 1, 1965.

On the basis of a total of 1,383,060 actual cases (consisting of cans of $\frac{1}{4}$-lb., $\frac{1}{2}$-lb., 1-lb., etc.), pink salmon accounted for 47.3 percent (654,421 cases of which 519,443 cases were 1-lb. talls) of the total canners' stocks on May 1, 1965. Next came chum (373,892 cases, mostly 1-lb. talls), followed by red (227,847 cases). The remainder of about 9.2 percent was coho (silver) and king salmon. Pink salmon stocks on hand packed in 48 1-lb. cans accounted for 79.4 percent of the to-

Table 1 - Total Canners' Stocks of Pacific Canned Salmon, May 1, 1965

Species	May 1, 1965	Apr. 1, 1965	Mar. 1, 1965
	(No. of Actual Cases)		
King	39,645	46,882	63,915
Red	227,847	299,277	411,505
Coho	87,255	102,233	128,589
Pink	654,421	849,663	1,201,716
Chum	373,892	428,803	536,529
Total	1,383,060	1,726,858	2,342,254

Table 2 - Total Canners' Stocks on Hand May 1, 1965 (Sold and Unsold), By Species and Can Size

& Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
4	3,995	57,005	20,244	2,464	122	83,830
4	31,212	118,901	16,947	125,557	45,997	338,614
4	4,335	51,883	46,771	519,443	315,530	937,962
1	103	58	3,293	6,957	12,243	22,654
	39,645	227,847	87,255	654,421	373,892	1,383,060

Table 3 - Canners' Shipments from July 1, 1964, to May 1, 1965, By Species and Can Size

& Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
4	20,252	370,927	102,448	9,217	1,322	504,166
4	105,630	568,193	37,428	477,911	112,094	1,301,256
4	17,786	446,171	121,738	1,878,481	563,077	3,027,253
1	313	4,892	18,197	92,440	27,299	143,141
	143,981	1,390,183	279,811	2,458,049	703,792	4,975,816

tal pink salmon stocks as of May 1, 1965, with the balance mostly in 48 $\frac{1}{2}$-lb. cans.

From April 1 to May 1, 1965, pink salmon stocks were lower by 195,242 actual cases (1-lb. talls lower by 157,119 cases), reds were down 71,430 cases, and chums were down 54,911 cases.

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

Shipments at the canners' level from July 1, 1964, to May 1, 1965, totaled 4,975,816 actual cases (equal to 3,947,064 standard cases).

Data on canned salmon stocks are based on reports from U. S. Pacific Coast canners who packed over 97 percent of the 1964 salmon pack. (Division of Statistics and Economics, National Canners Association, May 26, 1965.)

Shrimp

GULF AND SOUTH ATLANTIC LANDINGS, 1964:

United States commercial shrimp landings (heads-off weight) in the Gulf and South Atlantic States during 1964 totaled 124.3 million pounds with an ex-vessel value of $69.3 million--a decrease of 10 percent in quantity, but an increase of 1 percent in value from 1963. Landings in the southern States made up over 90 percent of the total 1964 U. S. shrimp catch.

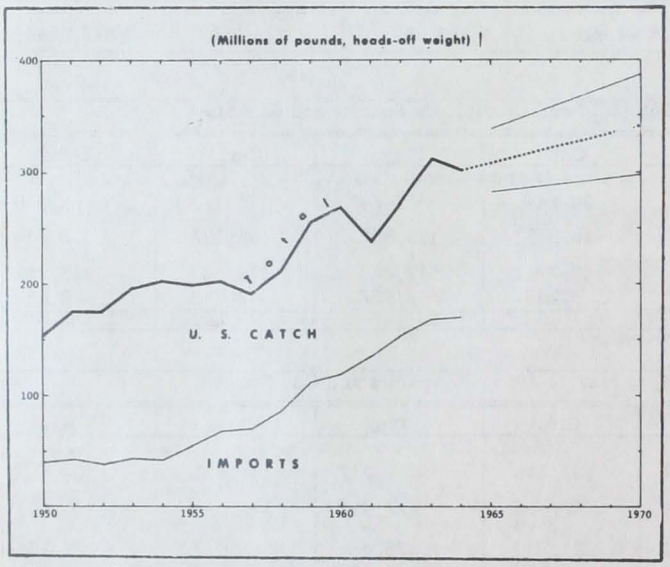


Fig. 1 - U. S. shrimp supply, 1950-1964 with forecast to 1970.

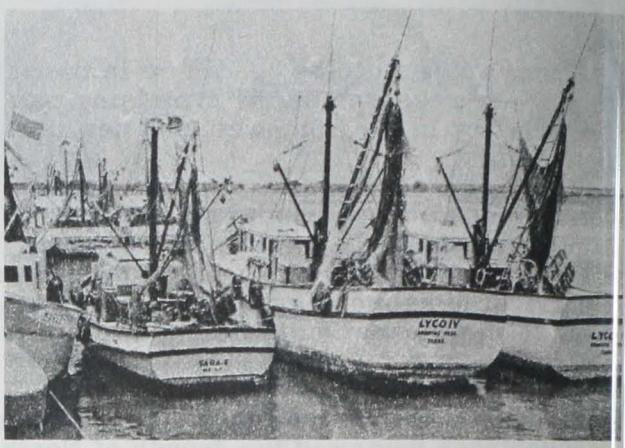


Fig. 2 - Shrimp trawlers at the dock in a Mississippi port.

In 1964, Texas led all other southern States with total shrimp landings of 41.6 million pounds, followed by Louisiana with 38.1 million pounds, and the Florida West Coast with 25.0 million pounds. The remaining 19.6 million pounds was landed in ports of Mississippi, Alabama, the Florida east coast, Georgia, South Carolina, and North Carolina.

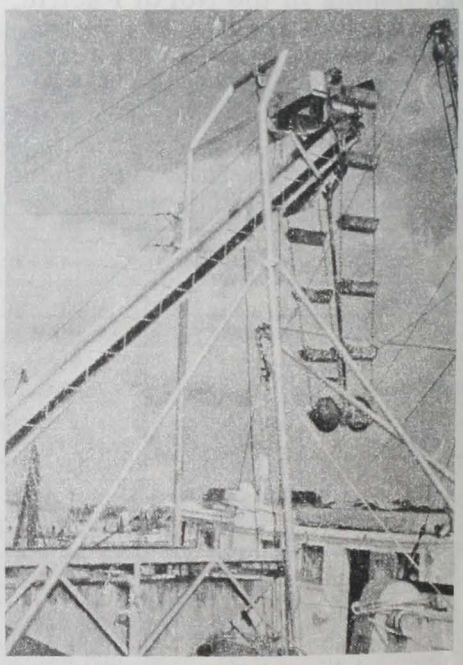


Fig. 3 - Conveyor used to unload shrimp from vessels at Aransas Pass, Tex.

Brown shrimp was the leading species landed in Texas, while white shrimp predominated at Louisiana ports, and pink shrimp made up the bulk of the Florida west coast landings.

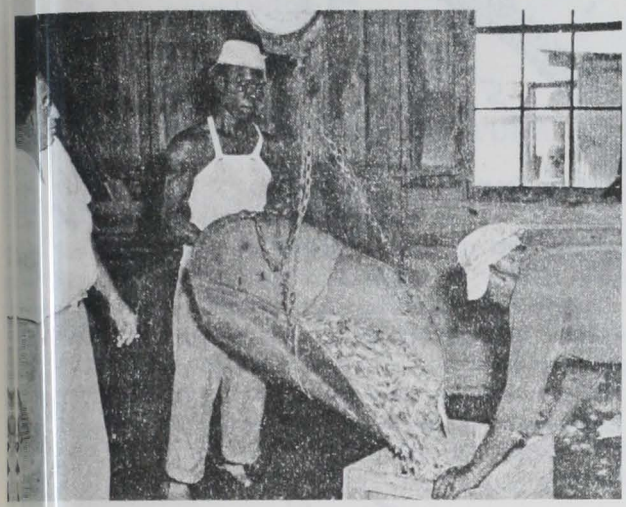


Fig. 4 - Weighing fresh heads-off shrimp in a Florida plant.

A breakdown, by major fishing areas, of the 1964 Gulf catch (excluding the Atlantic areas), shows 12.4 million pounds were taken from Sanibel and Tortugas; 3.2 million pounds from the Apalachicola area; 11.5 million pounds from Pensacola to the Mississippi River; 37.8 million pounds from the Mississippi River to Texas; 29.6 million pounds from the Texas coast; 5.2 million pounds from the high seas off the Mexican Coast west of 97° W. longitude; 12.2 million pounds from the high seas off Obregon and Campeche; and 1.1 million pounds from the Caribbean Sea south of 21° N. latitude. A large part of the Gulf catch was taken in depths of under 20 fathoms, and (with the exception of royal-red shrimp) almost all of the catch was taken under 35 fathoms.

Note: Gulf catch data for 1964 are not comparable with landings data shown above because in the Gulf data: (1) South Atlantic catches are not included, and (2) catch data include trips completed during the year, regardless of when landings occurred.)

South Atlantic Fisheries Explorations and Gear Development

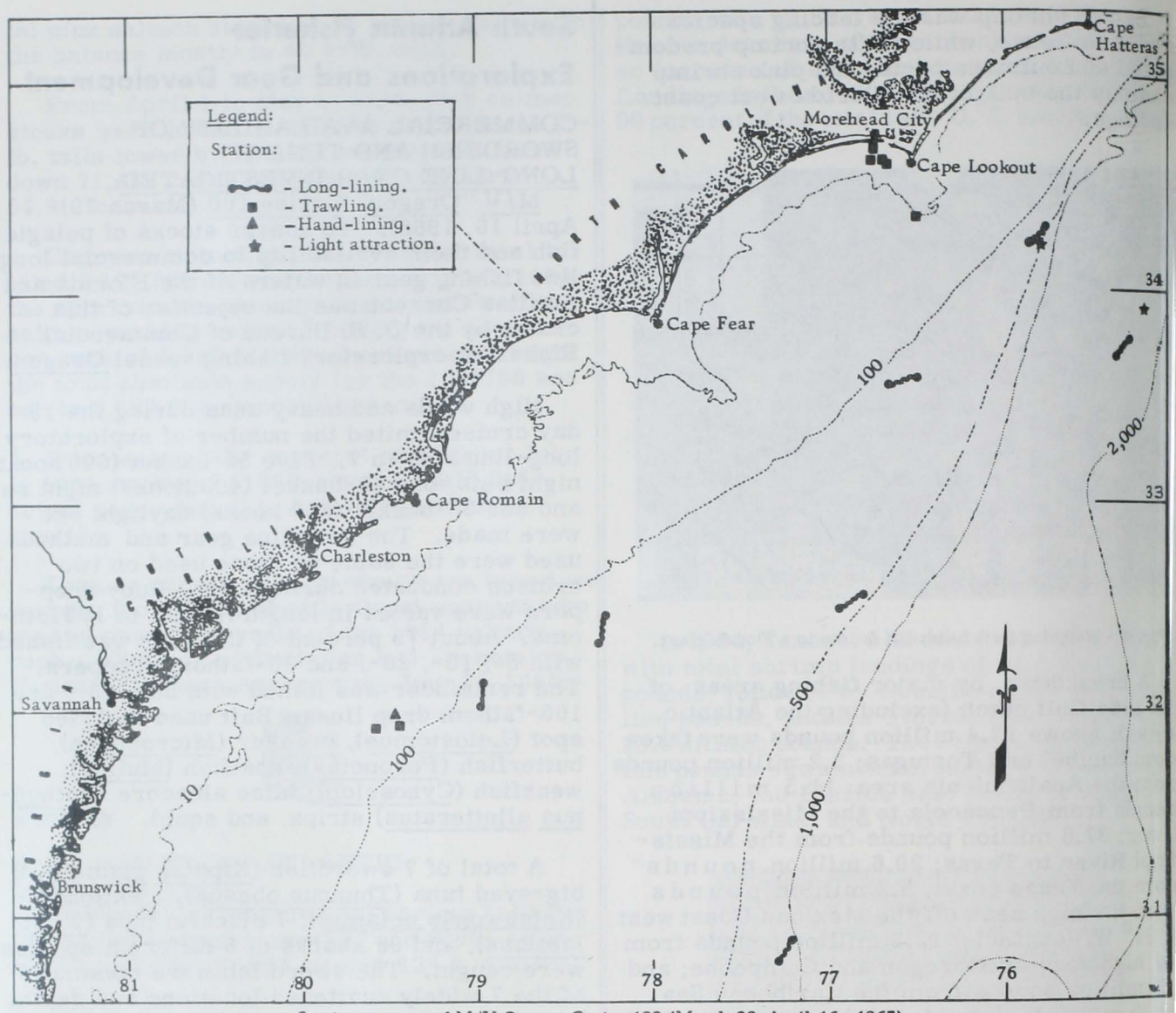
COMMERCIAL AVAILABILITY OF SWORDFISH AND TUNA TO LONG-LINE GEAR INVESTIGATED:

M/V "Oregon" Cruise 100 (March 29-April 16, 1965): To assess stocks of pelagic fish and their availability to commercial long-line fishing gear in waters of the Florida and Antilles Current was the objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon.

High winds and heavy seas during the 19-day cruise limited the number of exploratory long-line sets to 7. Five 50-basket (500 hooks) night sets, one 40-basket (400 hooks) night set, and one 30-basket (300 hooks) daylight set were made. The long-line gear and methods used were the same as those used on two cruises conducted during 1964. Buoy droppers were varied in length from 5 to 100 fathoms. About 75 percent of the gear was fished with 5-, 10-, 20-, and 30-fathom droppers. The remainder was fished with 50-, 75-, and 100-fathom drop lines. Bait used included spot (Leiostomus), croaker (Micropogon), butterfish (Poronotus), goatfish (Mullus), weakfish (Cynoscion), false albacore (Euthynnus alletteratus) strips, and squid.

A total of 7 swordfish (Xiphias gladius), 2 big-eyed tuna (Thunnus obesus), 1 skipjack (Katsuwonus pelamis), 7 blackfin tuna (T. atlanticus), and 98 sharks of 6 different species were caught. The swordfish were taken at 5 of the 7 widely scattered locations and depths sampled during the cruise. Three swordfish were caught at a station in 190 fathoms east of Frying Pan Shoal, and 4 swordfish were caught at 4 different localities with depths varying from 165 to 1,800 fathoms. Baskets with 10-fathom buoy droppers yielded 4 swordfish, those with 20-fathom droppers accounted for 2, and those with 50-fathom droppers yielded 1 swordfish. Two big-eyed tuna were caught on 20-fathom droplines over 1,800 fathoms east of Cape Lookout. One skipjack tuna was caught from a large school that had surfaced around the vessel during retrieval of the long line at one of the stations.

Large numbers of sharks were again encountered as in previous cruises to the area investigated at the edge of the Continental Shelf. They were a detriment to fishing oper-



Station pattern of M/V Oregon Cruise 100 (March 29-April 16, 1965).

tions and caused gear fouling resulting in mutilated fish. A total of 28 sharks, mostly silky (Carcharhinus falciformis, were taken in 165 fathoms at one station. At the station off Cape Lookout, an unexpected northwest drift moved the long-line set from 500 fathoms to 40 fathoms where 51 sharks, mostly silky and scalloped hammerhead (Sphyrna lewini), were taken. Very few sharks were encountered beyond the 200-fathom curve. A breakdown of the 98 sharks taken during the cruise is: 51 silky, 28 hammerhead, 10 night (Hypoprion signatus), 5 blue (Prionace glauca), 2 mako (Isurus oxyrinchus), and 2 whitetip sharks (Carcharhinus longimanus). Of those, 31 were tagged and released.

Bathythermograph (BT) casts were made at each long-line station occupied by the vessel. Thermocline depths and temperatures varied widely over the area surveyed. No correlations could be made with the data regarding the relation between swordfish occurrence and the temperatures and depths of the water masses. Two light-attraction and 7 nekton ring-net stations were occupied to sample macroplankton in the area.

During the cruise, 7 trawl hauls in shallow water were made off Savannah, Ga., and Morehead City, N.C., for obtaining bait. Flatfish and puffers dominated the catch in those two areas.

Trolling with bone and lead-head feather jigs yielded 52 false albacore averaging $6\frac{1}{2}$ pounds each. An electronic trolling alarm system was successfully installed aboard the

vessel and tested throughout most of the cruise.

Note: See Commercial Fisheries Review, March 1965 p. 50; January 1965 p. 47.

Tuna

1965 ALBACORE AND BLUEFIN TUNA CATCH FORECAST FOR UNITED STATES PACIFIC COASTAL AREA:

This report on the annual prediction for the expected tuna catch during 1965 in the temperate tuna fishery off the Pacific Coast was issued in May 1965 by the staff of the Tuna Forecasting Program, U. S. Bureau of Commercial Fisheries Biological Laboratory, La Jolla, Calif. It is the fifth in a series of annual predictions and includes additional data incorporated into the prediction system, with the addition of refinements where appropriate.

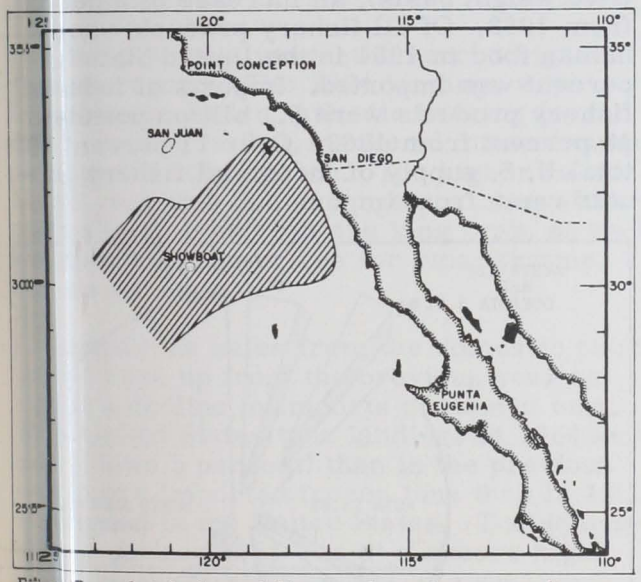


Fig. 1 - Cross-hatched area delineates the region expected to produce about two-thirds of the total July 1965 albacore tuna catch.

The forecast for 1965 consists of three separate estimates of (1) where, (2) when, and (3) how much tuna may be taken at the beginning and during the summer season. The estimates given for 1965 are in more detail on the southern California offshore region for albacore, with only an estimate of the catch for bluefin.

Where: The area that is expected to produce the best albacore fishing in July off southern California is shown in fig. 1. That area has been determined from April temperature and salinity data taken from a depth of 10 meters (32.8 feet), and represents the "optimum area" that may produce more than two-thirds of the total July 1965 catch. Upwelling has been relatively weak this year in southern California and Baja California, and the albacore may move closer to shore because clear, blue water may extend farther inshore than usual.

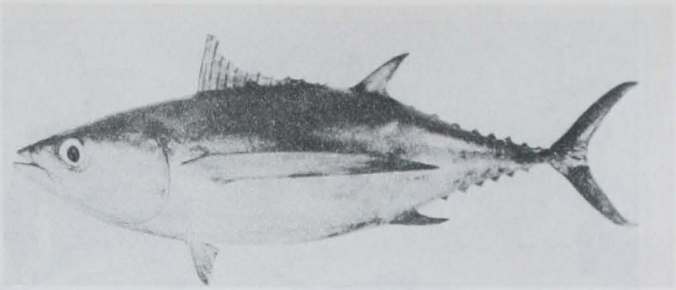


Fig. 2 - Albacore tuna (Thunnus alalunga).

When: Open ocean conditions in the region encompassing the usual migration route of albacore reflected considerable warming commencing as early as mid-February. That general warming trend prevailed through April, and suggests that the shoreward migration may occur earlier than in the last two years. In addition, the waters off Oregon and Washington were beginning to warm noticeably, and suggest that July landings may be near average.

How Much: It was estimated that June landings in southern California would be above the long-term average of 175,280 pounds. As in previous years, estimates of total annual albacore and bluefin landings are restricted by the data available to the region south of the United States-Mexican border for albacore, and for bluefin in the area to the north of the border. This year, about 12.6 million pounds of albacore is expected will be caught south of the United States-Mexican border, and about 8.6 million pounds of bluefin will be taken north of it. Those estimates are near the 14-year average landings for both species.

In 1964, the forecast for albacore landings south of the international border exceeded actual landings by only 13 percent, whereas actual bluefin landings were slightly more than half of the predicted amount. The cause for the major discrepancy in the bluefin estimate is most likely due to major changes in the fishing fleet. Whereas the albacore fleet has experienced no major changes in composition over the past few years, the bluefin fleet has changed greatly. During the past four years, the addition of most of the converted high-seas purse seiners to the bluefin tuna fishing fleet appears

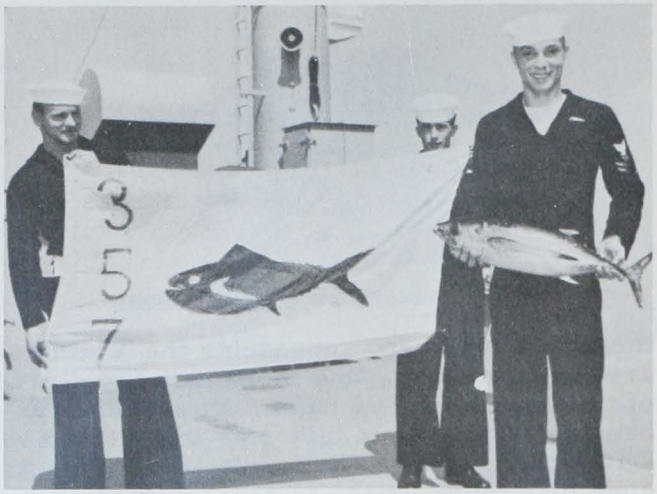


Fig. 3 - Men aboard a Navy radar picket vessel display a sample of their catch.

to have caused the center of production and fishing effort to be shifted farther south into Baja California offshore waters.

The U. S. Bureau of Commercial Fisheries planned to conduct an early-season survey of the "optimum area" for albacore by chartering two commercial albacore trollers. The vessels were to put out to sea on or after June 2 and, in conjunction with the California Department of Fish and Game research vessel N. B. Scofield (at sea from May 25 to June 23), were to report fishing conditions as they developed. Navy radar picket vessels were fishing since May 1, and were to report albacore catches as they occurred. Summary radio broadcasts were being made to the fishing industry to provide information on the shoreward movement of the summer albacore movement.

Note: See Commercial Fisheries Review, August 1964 p. 40.

United States Fisheries

IMPORTED FISHERY PRODUCTS ACCOUNT FOR HALF OF 1964 U. S. SUPPLY:

The United States continued in 1964 as the world's largest importer of fishery products despite very large untapped resources available in waters usually fished by U. S. commercial fishermen. For the second consecutive year, over half the U. S. supply of fish and shellfish in 1964 was from foreign sources. The estimated live weight of edible and industrial fishery products imported by the United

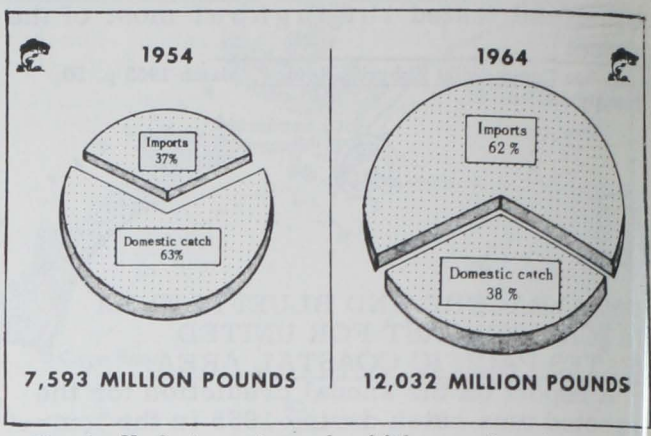


Fig. 1 - U. S. domestic supply of fishery products increased 58 percent since 1954.

States during the year was 7.5 billion pounds or 62 percent of the total available supply of 12 billion pounds.

United States imports of edible fishery products in 1964 totaled 2.4 billion pounds (live weight basis), an increase of 5 percent from 1963. Of all fishery products used for human food in 1964 in the United States, 49 percent was imported. Imports of industrial fishery products were 5.1 billion pounds, up 18 percent from 1963. Over 71 percent of the total U. S. supply of industrial fishery products came from imports.

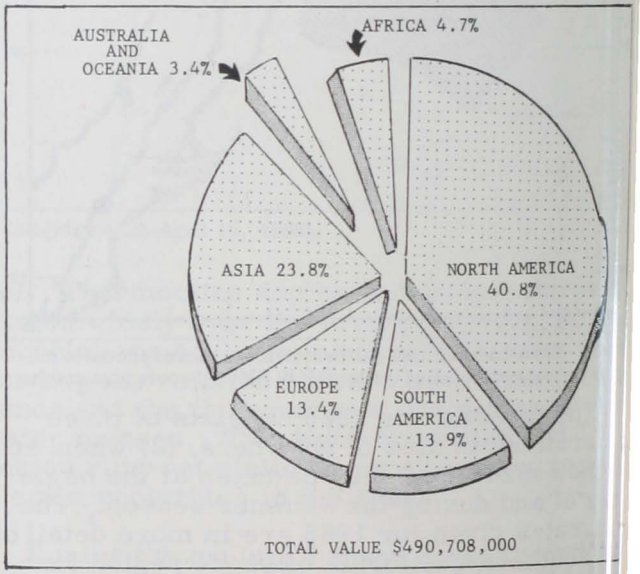
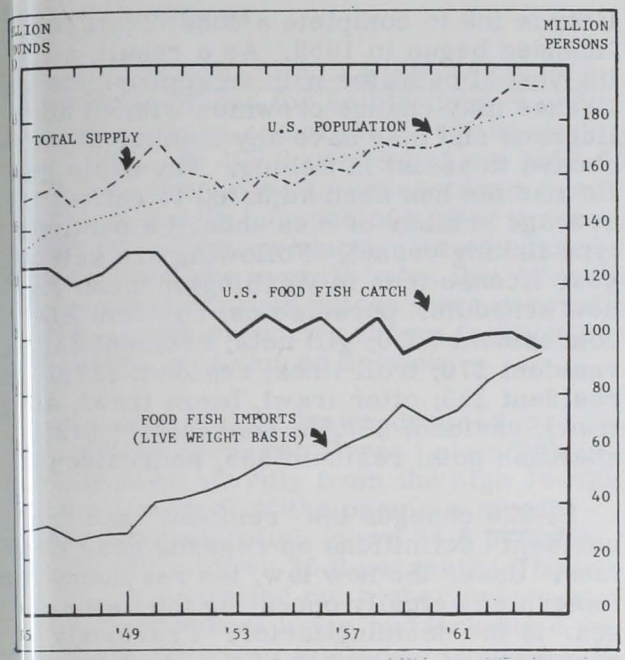


Fig. 2 - Value of U. S. imports from continent of origin, 196

In 1964 the U. S. catch of edible and industrial fish and shellfish dropped to 4.5 billion pounds, 7 percent less than in 1963 and the smallest since 1953. But the ex-vessel value of $390 million was up nearly $13 million



. 3 - Relationship of U. S. population to food fish and imorts, 1945-64.

m the previous year--the second highest ue on record. The 1964 landings were er for menhaden, Atlantic herring (sarcs), Pacific halibut, mackerel, tuna, shrimp, Atlantic ocean perch. The higher value the year was due to larger catches of Pacc salmon, blue crab and king crab, as well ighter average prices for tuna, shrimp, sea scallops.

Canned tuna sales from the domestic pack 1964 were up from the previous year as inst a decline in imports of canned tuna. le United States tuna landings in 1964 were er (down 5 percent) than in the previous r, more imported frozen tuna than in 1963 canned in the United States. The domesuna pack in 1964 was at a record high.

See Commercial Fisheries Review, April 1965 p. 38.

S. Fishing Vessels

PHLET ON RULES OF THE ROAD ED BY COAST GUARD:

pamphlet titled "Fishing Vessel Rules e Road" has been issued by the U. S. st Guard. The new rules are based on the sed international rules that become effecSeptember 1, 1965.

he new rules make substantial changes ght requirements, fog-signal procedures,

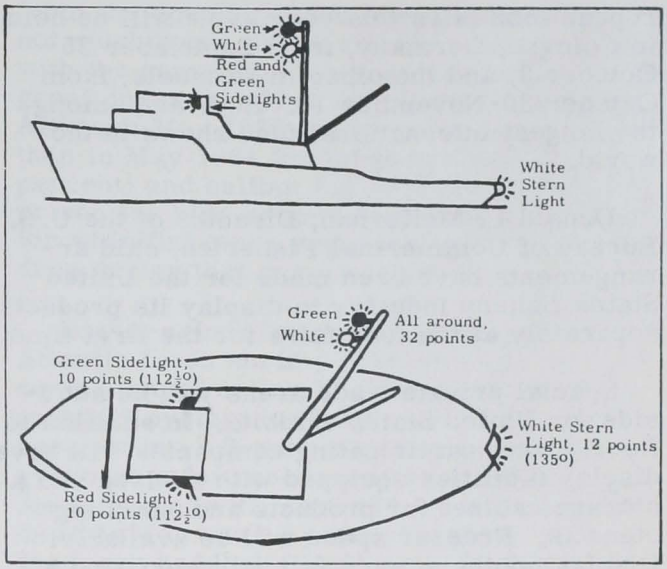
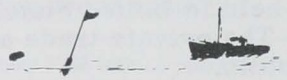


Illustration from booklet. Shows lights for vessels trawling (dragging of a dredge, net, or other apparatus through the water).

and other important aspects of Rules of the Road for fishing vessels on the high seas. Fishermen are urged by the Coast Guard to familiarize themselves with these rules before they become effective.



U. S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-May 1, 1965, amounted to 9,599,442 pounds (about 457,116 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. That was a decline of 18 percent from the 11,744,881 pounds (about 559,300 standard cases) imported during January 1-May 2, 1964.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the 12½-percent rate of duty is limited to 66,059,400 pounds (or about 3,145,685 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

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U. S. FIRMS INVITED TO PARTICIPATE IN LEADING FOOD FAIRS OF EUROPE:

Plans have been announced to include United States processed fishery products among items vigorously promoted at two major Eu-

ropean food fairs this year. One will be held in Cologne, Germany, from September 25-October 3, and the other in Brussels, from October 30-November 14. Both are among the largest international food shows in the world.

Donald L. McKernan, Director of the U.S. Bureau of Commercial Fisheries, said arrangements have been made for the United States fishery industry to display its products separately at the food fairs for the first time.

Special private trade areas will be set aside for United States exhibits. In addition to floor space, participating companies will have display facilities equipped with shelves and a storage cabinet for products and sampling utensils. Freezer space will be available. Display booths at each fair will surround a lounge where American representatives can meet with potential European customers. A full-time industry representative must be available at each exhibit.

Operation of the special trade areas will be similar to procedures followed at processed food exhibits held in United States Trade Centers abroad. The private trade areas are not open to the public.

Both of these fairs will stress processed food products. Any domestic firm, handling processed fishery products, will be eligible to participate. The fishery products to be displayed, however, must have been processed in the United States.

Each U. S. firm will be required to provide, at its expense, a full-time representative, either from the United States or abroad. Also, each company will be responsible for the expense involved in shipping its products to the food fair.

Washington

NEW 1965 STATE LAWS AFFECTING FISHERIES:

Following is a report from the Fishermen's News, Vol. 27, No. 7, on fisheries bills which were passed by the Washington State Legislature and signed into law by the Governor in 1965:

S. 252 abolishes the personal license and fee of $10. That fee has been absorbed in the gear license fee to complete a consolidation of licenses begun in 1959. As a result, a fishing vessel operator with an appropriate gear license may change crewmen without added licenses and may have any number of men aboard to assist in fishing. The basic gear license fee has been adjusted to reflect the average number of men aboard a particular type fishing vessel. Following are selected gear license fees in Washington under the new schedule: purse seine, resident $145, nonresident $230; gill nets, resident $35, nonresident $70; troll lines, resident $27.50, nonresident $55; otter trawl, beam trawl, shrimp trawl, resident $87.50, nonresident $135; shellfish pots, resident $35, nonresident $6(

H. 220 changes the "resident" and "nonresident" definitions as regards gear licen fees. Under the new law, the residency of fishermen actually operating the vessel or gear is the deciding factor. Previously the residency of the owner of the vessel or gea has been the determining factor.

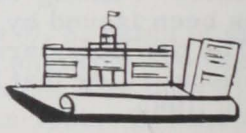
S. 265 defines the primary market value of fishery landings as it relates to a base price to be used in applying the ad valorem 2 percent and 1 percent privilege and catch fees. Primary market value is defined as t ex-vessel or dockside price at all landing ports in the State and includes advance pric as well as final settlements. It does not include vessel or owner subsidies.

H. 219 redefines the fish buyer's license requirements to include all persons who pu chase or receive fish at places other than t employer's business premises.

H. 218 redefines wholesale license provisions.

H. 217 redefines the Lummi Island ree areas.

H. 216 abolishes the $5 hard-shell clam cense and provides that hard-shell clams m only be dug for commercial purposes on li censed clam farms. (Hard-shell clams ma still be dug commercially on Indian reser tions.)



holesale Prices

IBLE FISH AND SHELLFISH, MAY 1965: Wholesale prices for edible fishery prodts (fresh, frozen, and canned) were up slightly May 1965. At 109.2 percent of the 1957-59 erage, the index rose 0.4 percent from April May principally because of higher prices several fishery products. As compared th May 1964, the overall index this May was 3.6 percent because prices were generally her for most products, except fresh-water h, oysters, and canned salmon.

In the subgroup for drawn, dressed, or whole ish, prices for fresh Great Lakes fish in were down sharply from the high Jewish iday price level of the previous month--e Superior whitefish (down 31.8 percent) yellow pike (down 35.0 percent). Those er prices cancelled out higher prices at ton for ex-vessel large haddock (up 6.5 cent) and the subgroup index dropped 4.4 cent from April to May. Prices for west-halibut and salmon in May 1965 were unged from the previous month. Supplies of se species in May were still mostly frozen use market receipts of the fresh product from the opening of the seasonal fishery were not much more than a trickle. As compared with the same month a year earlier, the subgroup index this May was down 1.3 percent. Although May 1965 prices were much higher than in May 1964 for large haddock (up 22.3 percent) and halibut (up 18.0 percent), lower prices for king salmon and fresh Lake Superior whitefish were responsible for the index drop during that same period.

Higher prices from April to May for South Atlantic fresh shrimp (wholesale price up 5 cents a pound) at New York City and shucked standard oysters (up 3.7 percent) at Norfolk resulted in a 3.8-percent increase in the subgroup index for processed fish and shellfish. As compared with May 1964, the subgroup index this May was 1.5 percent higher--prices for fresh haddock fillets were 12.0 percent higher, for shrimp up 6 percent, but for shucked oysters were down by 5.0 percent.

Wholesale prices at Chicago for frozen shrimp dropped 1.6 percent from April to May as against higher prices for frozen flounder and haddock fillets. The May 1965 subgroup index for processed frozen fish and shell-

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, May 1965 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1957-59=100)			
			May 1965	Apr. 1965	May 1965	Apr. 1965	Mar. 1965	May 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					109.2	108.8	108.3	105.4
Fresh & Frozen Fishery Products:					112.9	113.3	112.5	107.4
Drawn, Dressed, or Whole Finfish:					106.1	111.0	110.8	107.5
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.10	.09	74.0	69.5	87.4	60.5
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.41	.41	119.8	119.8	117.3	101.5
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.83	.83	115.3	115.3	115.3	127.8
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.58	.85	86.6	126.9	93.3	92.5
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.65	1.00	106.4	163.7	139.2	94.2
Processed, Fresh (Fish & Shellfish):					118.9	114.5	112.3	117.2
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.33	.35	80.2	85.0	97.1	71.6
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.05	1.00	123.0	117.2	111.3	116.0
Oysters, shucked, standards	Norfolk	gal.	7.13	6.88	120.2	115.9	115.9	126.5
Processed, Frozen (Fish & Shellfish):					109.4	109.5	109.3	94.7
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.37	98.8	93.8	95.0	92.5
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.38	.37	109.9	108.5	112.9	104.1
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.30	.30	105.2	105.2	108.7	105.2
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.93	.94	109.7	111.5	108.5	88.3
Canned Fishery Products:					103.0	101.2	101.3	102.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	21.00	20.25	91.5	88.3	89.3	97.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.44	102.6	101.6	101.6	102.1
Mackerel, jack, Calif., No.1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.13	7.13	120.9	120.9	120.9	103.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.25	10.25	131.5	131.5	128.3	113.7

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.

fish dropped only slightly (down 0.1 percent) as a result. As compared with May 1964, the index this May was up 15.5 percent because of much higher prices for frozen shrimp (up 24.2 percent) and several frozen fillet items. But prices for ocean perch fillets were the same as in May 1964.

The May 1965 index for canned fishery products rose 1.8 percent from the previous month. The market outlook for canned pink salmon appeared good, stocks continued to move well, and prices were up 3.6 percent from a month earlier. Average prices for canned tuna (up 1.0 percent) were up slightly from April to May because of a nominal increase in prices for tuna packed under private label but prices for advertised brands were unchanged from the previous month. Prices paid by California canneries for ex-vessel tuna were higher during May. The subgroup index in May 1965 was up 0.8 percent from the same month a year earlier because of higher prices for all canned fish except salmon (down 5.7 percent).

SPACE AGE SALMON SALAD SERVED ASTRONAUT

A 238-calorie portion of freeze-dried salmon salad was included on the space menu of Astronaut James A. McDivitt during the Gemini 4 flight in June 1965. The salmon salad was one of the items specially chosen by McDivitt, who is reported to be a seafood connoisseur. Cost of a space meal is about $255.

The salmon salad was served as a supper accompanied by pea soup, toast, fruit cocktail, and orange juice. All the food is freeze-dried, compressed, and dehydrated; it must be reconstituted with water. McDivitt and his co-Astronaut Edward H. White II picked out the food they wanted after trying out all the items available. White did not pick a fish dish. (The Evening Star, Washington, D. C., June 5, 1965.)

CORRECTION

The April 1965 issue, page 22, in the table "U. S. Supply of Fish Meal and Solubles, 1963-64," the item under domestic production shown as "herring, Alaska," should simply read "herring."