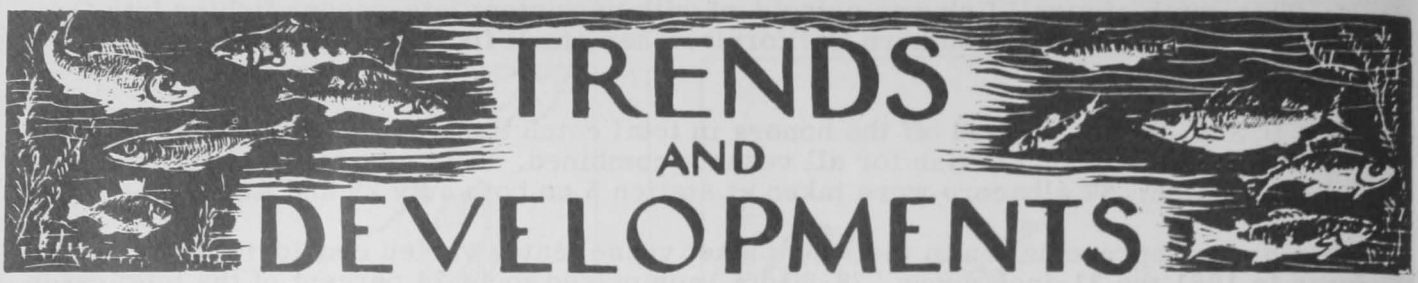


California

ARTIFICIAL FISHING REEF MADE FROM QUARRY ROCK:

The first strictly "production model" artificial fishing reef has been built off Redondo Beach, Los Angeles County, the California Department of Fish and Game reported in February this year.

Patterned after earlier experimental models developed by the Department, the 625-foot quarry rock reef was financed by the County's fish and game fine money. State law requires that one-half of the money collected from fish and game violation fines be retained by the County to be used for fish and wildlife projects.

The reef area will be marked with buoys and opened to fishing when the fish population becomes sufficient to support a sport fishery, probably about July of this year.

The reef is expected to attract populations of sand bass, kelp bass, croakers, bonito, California halibut, and other species. In the experimental program, up to 1,300 fish have been counted at a single reef site.

The Wildlife Conservation Board experimented with three reefs in Santa Monica Bay in 1960. They were located in different areas and made of different materials. Old car bodies, streetcar bodies, artificial rock, and quarry rock were used in the experimental program, and the latter proved to attract the most fish. It is also more durable.

The Board has allocated funds for 4 quarry rock reefs, 2 off Orange County and 2 off San Diego County. Orange County also plans to build 2 reefs with fish and game fine money.

* * * * *

FLOODS DAMAGE FISH STOCKS OF HATCHERIES:

Three days of heavy rain at the end of January 1963 resulted in floods which caused large fish losses at three hatcheries of the California Department of Fish and Game. Affected were the Trinity River Hatchery in Trinity County, the Nimbus Hatchery on the American River in Sacramento County, and the Kern River Hatchery in Kern County.

Silt-laden water killed 350,000 of the remaining 800,000 king salmon fry at the Trinity River Hatchery. About 1,200,000 salmon fry already had been planted.

At the Nimbus Hatchery, floods and silt killed 230,000 yearling steelhead, thus wiping out a major part of the steelhead stock developed for planting in the American River in 1963. Only 58,000 yearling steelhead from Nimbus had been planted in January 1963 before the flood.

Most of the fish racks at Nimbus, which block fish passage upstream and divert fish into a ladder leading to the hatchery, were washed out. This is expected to reduce to a trickle the number of steelhead entering hatchery ponds for the rest of 1963, although 530 adult steelhead moved into the ponds during the storm. Salmon egg taking at Nimbus had about ended before the storm, and the floods did little damage to steelhead eggs or to salmon eggs and fry. The Hatchery hopes to be able to meet 1964 steelhead planting needs with the present supply of steelhead eggs.

At the Kern River Hatchery, about 225,000 trout which would have been stocked for fishermen to catch this summer were washed into the river. Only about 10,000 are expected to be recovered. Some of the trout lost will survive to provide good fishing this summer in the Isabella Reservoir and nearby waters. Fingerling trout will be transferred to Kern from other hatcheries, to be raised to meet catchable trout planting needs this summer.

The California Department of Fish and Game estimated that silt and floods would cause some damage to fish and spawn in the

streams, but higher flows of water would benefit other young fish by helping them out to sea. (California Department of Fish and Game, February 9, 1963.)

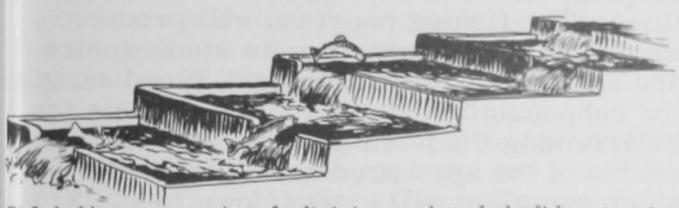
* * * * *

NEW FISHWAY MAY REESTABLISH KING SALMON RUN ON EEL RIVER:

The reconstructed fishway at Snow Mountain, which provides passage for salmon and steelhead trout over Van Arsdale Dam on the Eel River, is paying dividends, according to the California Department of Fish and Game.

King salmon have been counted climbing the fishway ladder for the first time in 12 years.

The old fishway at Van Arsdale Dam was built in the 1930's. Salmon runs above the dam began to decline when migrating fish found water spilling over the dam more attractive than the fishway. Salmon and steelhead would jump against the dam in a futile attempt to get over it. Steelhead would eventually make their way to the fishway, but the ladder's high steps and small pools made passage difficult. Many were taken from the ladder and trucked above the dam to help them on their way.



Fish ladders are a series of adjoining pools to help fish get past dams or falls.

King salmon wouldn't even try the fishway. Salmon runs declined from the thousands to the hundreds, then virtually stopped in the 1950's.

The redesigned facility at Van Arsdale Dam channels fish directly into the fishway, so they have no opportunity to jump against the dam. The new fishway ladder is designed for jumps of 12 inches or less, compared to 18- to 24-inch jumps in the past. Pools are a minimum of three feet deep, compared to 18 to 24 inches in the old fishway.

The fishway was redesigned and rebuilt by the California Department of Fish and Game in an effort to restore the once heavy king salmon runs to spawning areas above the dam.

Cans--Shipments for Fishery Products, January-December 1962

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants in 1962 was 6.3 percent above that used during 1961. The increase was due to a gain of 26.9 percent in combined shipments to the Eastern, Southern, and North Central Areas. The pack of Maine sardines in 1962 was much greater than in 1961. There was also an increase in the 1962 pack of tuna, salmon, and shrimp, but there was a decline in the California pack of mackerel, sardines, and anchovies.

In 1962, shipments to the Pacific or Western Area accounted for 68.3 percent of total shipments; shipments to the Eastern Area accounted for 28.5 percent; and shipments to

U. S. Domestic Shipments of Metal Cans for Fishery Products, 1962 and 1961
(Base Boxes of Metal Consumed in the Manufacture of Cans for Fishery Products)

Receiving Area	First Quarter		Second Quarter		Third Quarter 1/		Fourth Quarter		Total	
	1962	1961	1962	1961	1962	1961	1962	1961	1962	1961
East 2/	158,531	3/	189,556	3/	340,715	3/	191,087	3/	879,889	3/
Southern	13,403	3/	32,668	3/	21,765	3/	30,269	3/	98,105	3/
North Central	63	3/	29	3/	22	3/	26	3/	140	3/
Total 3/	171,997	193,197	222,253	215,510	362,502	180,504	221,382	181,861	978,134	771,072
West 4/	414,199	335,133	701,831	708,423	562,168	633,374	425,942	450,363	2,104,140	2,127,293
Total all Areas	586,196	528,330	924,084	923,933	924,670	813,878	647,324	632,224	3,082,274	2,898,365

1/Revised.
2/Includes Puerto Rico.
3/The grouping of States by geographic areas for reporting purposes was changed in 1962, so only total shipments in 1961 to the East, Southern, and North Central Areas are shown.
4/Includes Alaska and Hawaii.

the Southern Area accounted for most of the remaining 3.2 percent. Most of the fish-canning facilities are located in the Pacific Area.

Note: (1) Statistics cover all commercial and captive plants known to be producing cans. The data for 1961 cover only shipments of steel (tinplate) cans, but the data for 1962 cover shipments of steel and aluminum cans. It is believed that only a small amount of aluminum is being used in cans for fishery products at present. The tonnage equivalent figure for 1961 data is derived by use of the factor 23.0 base boxes per short ton of steel. The tonnage equivalent figure for 1962 data is derived by use of the factor 21.8 base boxes per short ton of steel. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size.

(2) See Commercial Fisheries Review, March 1963 p. 21, August 1962 p. 17.

Central Pacific Fisheries Investigations

PLANS FOR PARTICIPATION IN INTERNATIONAL INDIAN OCEAN EXPEDITION:

The staff of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu early in January this year was actively preparing to carry out research on the fishes and fishery resources of the Indian Ocean, as part of the United States participation in the International Indian Ocean Expedition. A massive scientific effort mounted with about 40 research vessels from 20 countries, the Expedition represents an attempt to apply to a single ocean basin the kind of complex international scientific cooperation that produced such fruitful results during the International Geophysical Year. The total field work is to extend from 1961 to 1964 and will encompass submarine geology, physical and chemical oceanography, meteorology, as well as the marine biology of the Indian Ocean.

The studies by the Bureau's Laboratory staff are centered around the United States Program in Biology and its research vessel the Anton Brunn. The Brunn is scheduled to make nine cruises into the Indian Ocean and adjacent seas from March 1963 to December 1964. The United States Program in Biology is being administered by the Woods Hole (Mass.) Oceanographic Institution.

The Bureau's Honolulu Laboratory will plan and implement that part of the United States biological program which pertains to fishery biology. For the off-shore waters of the Indian Ocean the Laboratory has outlined an extensive ecological study of the apex fish predators such as tunas and billfish. Since the Japanese have a commercial long-line fishery already operating in the Indian Ocean, the areas of high abundance of the commercially important fish species have been defined. The studies, therefore, will be centered around the collection of basic biological data to aid in understanding the interrelationship between species and to study distribution of the apex predators in relation to the environment. Since the most pronounced environmental feature in the Indian Ocean is the change in wind regime (southwest monsoon and northeast monsoon), the two cruises for the collection of data on apex predators were selected to cover these two periods. The first cruise (cruise 2 of the Anton Brunn) will extend from May to July 1963 during the southwest monsoon, while the second cruise (cruise 5) will extend from January to March 1964 during the northeast monsoon. Although surface trolling will be carried out during all daylight runs, the principal sampling tool for the apex predators on both cruises will be the tuna longlines. The fishing program will produce whole samples for taxonomic studies, size and sex data on all fish caught, blood samples for subpopulation studies and materials for determining the feeding habits and spawning cycles of the apex predators. Furthermore, since sampling will extend down to 40° S. latitude, some information on the southern extent of the distribution of some of the apex predators will be obtained.

While the data obtained from the two cruises by the Anton Brunn will be limited in scope and application, several studies will be implemented by data from other sources covering a wider area of the Indian Ocean. Emphasis will be on extending the study of the distribution of tuna larvae and juveniles and obtaining blood samples for subpopulation studies from areas other than those covered during the two cruises. For the study on the relation of the apex predators and the environment plans include (1) an ocean-wide analysis of the large body of physical and chemical data which will be available at the end of the Expedition, (2) a study of the copepods of the genus Candacia as indicators of water masses, and (3) an analysis of all available catch and effort data for apex predators in the Indian Ocean in relation to the environment.

A second phase of the Laboratory's program in the Indian Ocean will be centered on the bottom fish and invertebrate resources of the Bay of Bengal and the Arabian Sea. A series of inshore-offshore transects with a 42-foot trawl will be made in the Bay of Ben

gal during the March to May 1963 cruise of the Anton Brunn. A similar sampling program will be carried out in the Arabian Sea during the September to December 1963 cruise.

rabs

EW PROCESSING MACHINERY FOR LUE CRABS BEING DEVELOPED:

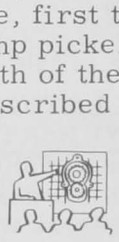
A contract on developing mechanical means f debacking and cleaning cooked blue crabs s being financed with funds provided by the J. S. Bureau of Commercial Fisheries. The ontract is being supervised by the Bureau's ollege Park, Md., Technology Laboratory, nd originally called for a simply designed nd relatively inexpensive shop-model machine that could be used by all crab-meat packers. The developmental research by the contractor has shown so much promise that he contract has been extended to include the production of a plant prototype machine.

In November 1962, the contractor met with he Laboratory staff to discuss the direction f future work. At that time it was learned hat they had developed what might be termed revolutionary concept of a machine for leaning and preparing crab cores for the picker. Using this new principle of core preparation, it looked entirely possible to make a machine that was so simple it could e manufactured for less than $2,000. This ompares with a cost of $10,000 or more for ny one of several machines with similar unctions that have been developed by private nventors in recent years.

It developed during the meetings that the ontractor's engineers had found the solution o the problem, and were so far along with he development of machinery that it would e a mistake to stop at the shop model stage. t was evident that with additional time of about two months and some extra funds the contractor would be able to go directly to the plant prototype. The proposed prototype design also included a concrete and apparently workable idea for extracting lump crab meat by machine. Following the November 1962 meetings between the Laboratory staff and he contractor's engineers, approval was obtained in late January this year to begin on he final phases of this machine development.

The extension of the contract calls for the design and production of a prototype machine for handling cooked crabs, at the rate of about one per second, and producing a cleaned core in such a manner that the backfin lump can be readily removed. Prior to hitting upon the principle of the present cleaning machine, considerable work had been done on an automatic "orienter" that would take a mass of cooked crabs and feed them into a debacker-cleaner in a set position--for example, backs up, eyes to the left, if this was the desired orientation for the next step. However the design of this machine was fairly complex and consequently it has been bypassed for the present, it being felt that most plants would find it much more economical to use two or three workers to orient visually and feed manually the debacker-cleaning machine.

With the contractor's efforts concentrated on the final design and fabrication of the cleaning machine only, it was estimated, that this could be completed in early April. As soon as the machine can be installed in a plant, and the spring run of crabs starts to provide working material, interested industry members will be invited to observe the machine in operation. The demonstration will be followed by a meeting with an industry committee to discuss and approve plans for the next steps toward mechanization. Depending on the priority assigned by this committee, the "orienter" described above might be completed next, or the next steps might more logically be, first the development of a mechanical lump picker, then the flake meat picker. Both of these machines are in what might be described as an advanced conceptual stage.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-SEPTEMBER 1962:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, more fresh and frozen fishery products were purchased by the Defense Subsistence Supply Centers during the third quarter of 1962 than in the same period of 1961. The increase was 4.3 percent in quantity and 38.4

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, July-September 1962 with Comparisons

QUANTITY				VALUE			
July-Sept.		Jan.-Sept.		July-Sept.		Jan.-Sept.	
1962	1961	1962	1961	1962	1961	1962	1961
(1,000 lbs.)				($1,000)			
5,961	5,715	17,934	16,587	4,213	3,044	10,975	8,355

percent in value. During the first nine months of 1962, purchases were up 8.1 percent in quantity and 31.4 percent in value, as compared with the same period in 1961. Because of the purchase of higher-priced fishery products and an increase in the price of most fishery products, the value increased more than the quantity.

Canned: Purchases of canned fishery products for the use of the Armed Forces in the third quarter of 1962 were extremely

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, July-September 1962 with Comparisons

Product	QUANTITY				VALUE			
	July-Sept.		Jan.-Sept.		July-Sept.		Jan.-Sept.	
	1962	1961	1962	1961	1962	1961	1962	1961
	(1,000 lbs.)				($1,000)			
Tuna	1	1,731	3,708	4,393	1/	765	2,062	1,940
Salmon	1	1,401	1,016	1,403	1/	891	638	893
Sardines	15	31	65	121	6	13	31	57

1/Less than $1,000.

light. In the first 9 months of 1962 purchases of the three principal canned fishery products (tuna, salmon, and sardines) were down 19.1 percent in quantity and 5.5 percent in value as compared with the same period in 1961.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

Fish Oils

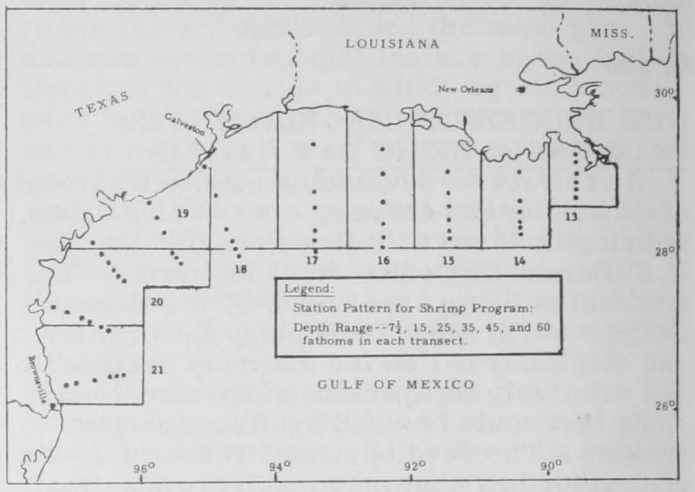
MOLECULAR DISTILLATION AIDS RESEARCH ON POLYUNSATURATES: During 1962, close to 4,000 pounds of crude fish oil and fish oil derivatives such as fatty acids and fatty esters were refined by adsorptive bleaching and molecular distillation at the Seattle Technological Laboratory of the U. S. Bureau of Commercial Fisheries. The material processed was distributed to other laboratories for research purposes.

Molecular distillation has provided a means of obtaining oil samples with a higher percentage of polyunsaturates which are of particular interest to researchers.

Although most of the material was sent to laboratories interested in nutritional research, some was also sent to laboratories that were interested in chemical derivatives and other means of commercial utilization.

Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES: M/V "Gus III" Cruise GUS-1 (January 22-February 5, 1963): Catches were generally light during this cruise off the coast of Lou-



Shows the station pattern for Cruise GUS-1 of the chartered research vessel Gus III, January 22-February 5, 1963.

isiana and Texas by the chartered research vessel Gus III. The vessel (operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries) was engaged in a continuing study of the distribution of shrimp in the Gulf of Mexico.

Eight statistical areas (13, 14, 15, 16, 17, 18, 19, and 20) were covered. Because of severe weather, it was not possible to fish at all scheduled stations. But one 3-hour tow with a 45-foot shrimp trawl was made in each of 3 depth ranges (0-20, 20-40, and 40-60 fathoms) in all areas, except area 20.

The best single catch per 3-hour tow was 51 pounds of 12-15 count brown shrimp taken from 20-40 fathoms in statistical area 17. The other areas yielded fair catches of brown shrimp as follows: 34 pounds (31-40 count) from the 0-20 fathom range in area 18; 22 pounds (15-20 count) from the 0-20 fathom depth in area 19; 21 pounds (12-15 count) from 20-40 fathoms in area 20; 12 pounds (21-25 count) from the 20-40 fathom range in area 13; and 12 pounds (12-15 count) from 40-60 fathoms in area 14.

Areas 13 and 15 were the only areas producing more than a scattering of white shrimp. A catch of 13 pounds of 26-30 count white shrimp was taken from the 0-20 fathom range

in area 13. The white shrimp catch in area 15 consisted of 15 pounds (31-40 count) from the 0-20 fathom range and 15 pounds (21-25 count) caught at depths up to 40 fathoms.

Pink shrimp were taken at only 3 stations; the catch in each case was less than 1 pound.

Notes: (1) Shrimp catches are heads-on weight, shrimp sizes are the number of heads-off shrimp per pound.
(2) See Commercial Fisheries Review, February 1962 p. 37.

Industrial Fishery Products

FISH MEAL MARKET TRENDS IN SOUTHEASTERN STATES SURVEYED:

In late January and early February this year, a U. S. Bureau of Commercial Fisheries animal nutritionist, visited scientists at the Arkansas Agricultural Experiment Station and representatives of mixed feed corporations at various localities in Arkansas and southern Missouri and at Memphis, Tenn. He made these visits following his attendance at the Southeastern Poultry and Egg Association Convention at Atlanta, Ga., January 28 to 30.

At the Convention, it was pointed out that a general trend toward increased egg production in the Southeastern States is in evidence. However, this growth of the egg production industry appears not to be at the expense of the broiler industry; the latter is growing also but at a decelerating rate. Much of the new egg production can be absorbed by the producing States. For example, Florida is leading the present expansion but does not as yet produce enough eggs to satisfy its own needs. This expansion will result in some increase in utilization of fish reduction products. Poultry breeder rations are usually supplied with fairly liberal proportions of fish meal, and laying rations usually contain some fish meal although the concentration of the meal in layer rations is ordinarily only a fraction of 1 percent. Thus the long-term prospect appears to be that demand for fish meal in the Southeast will increase.

Investigators at the Arkansas Agricultural Experiment Station reported to the animal nutritionist further progress toward obtaining the fish unidentified growth factors in highly concentrated form. However, until they can isolate the factors in pure chemical form, analyze them, and produce them by chemical synthesis, fish products will remain the most reliable source of these factors.

Nutritionists employed by mixed feed companies are showing a great deal of interest in methods of determining the quality of protein in fish meal. Some of them hope to be able, eventually, to determine the quality of the protein in each shipment of fish meal they buy.

* * * * *

MORE FEDERAL SPECIFICATIONS FOR USE OF FISH OIL IN PAINTS REQUIRED:

The use, procurement, and testing of paints and other organic coatings by the Federal Government were surveyed by a chemical engineer of the U. S. Bureau of Commercial Fisheries. He learned that there is no Federal Specification for fish oil for use in organic coatings.

There are several Federal Specifications which permit the use of fish oil in paint, varnish, and related materials, provided the products meet performance specifications. They are:

(1) TT-P-0085a (DOD); Interim Federal Specification; Paint, Reflectorized, for Airfield Runaway Marking (Drop-in-Type).

(2) TT-P-00530 (NAVY-Ships); Interim Federal Specification; Coating Compound, Rust Inhibitive, Fish Oil Base.

(3) TT-P-664a; Federal Specification; Primer Coating, Synthetic, Rust-Inhibiting, Lacquer-Resisting.

(4) TT-P-666a; Federal Specification; Primer Coating, Zinc Yellow, for Aluminum and Magnesium Surfaces.

(5) TT-P-781a; Federal Specification; Putty and Elastic Compound; (for) Metal Sash Glazing.

The above list can be expanded, once the basic fish oil quality is covered by specification. The Government agencies using the paints will require proof of superior performance for unit cost or equal performance at lower cost compared to products covered by existing specifications.

The next step required in establishing a Federal Specification for fish oil for use in organic coatings is the drawing up of a sug-

gested specification patterned after Federal Specifications TT-S-600, Soybean Oil (for use in organic coatings) or TT-L-215a, Linseed Oil, Raw (for use in organic coatings).

* * * * *

U.S. FISH MEAL AND SOLUBLES:

Production and Imports, 1961-62: Based on domestic production and imports, the United States available supply of fish meal for 1962 was 31,461 short tons (or 6.2 percent) greater than during 1961. Domestic production was 3,001 tons (or 1.0 percent) less and imports were 34,462 tons (or 15.8 percent) greater than in 1961. Peru continued to lead other countries with shipments of 186,249 tons during 1962--34,810 tons above the imports in 1961.

The United States supply of fish solubles (including homogenized fish) during 1962 was 10,743 tons more than during 1961. Domestic production increased 10.0 percent, but imports dropped 6.4 percent.

U. S. Supply of Fish Meal and Solubles, 1961-62

Item	1/ 1962	1961
	. . .(Short Tons). . .	
Fish Meal and Scrap:		
Domestic production:		
Menhaden	243,839	247,551
Tuna and mackerel	20,874	21,243
Herring	3,543	5,268
Other	20,080	17,275
Total production	288,336	291,337
Imports:		
Canada	42,806	38,218
Peru	186,249	151,439
Chile	9,247	12,074
Angola	-	1,543
So. Africa Republic	10,084	13,026
Other countries	3,921	1,545
Total imports	252,307	217,845
Available fish meal supply	540,643	509,182
Fish Solubles:		
Domestic production 2/	123,415	112,241
Imports:		
Canada	1,335	1,001
So. Africa Republic	1,717	1,351
Other countries	3,256	4,387
Total imports	6,308	6,739
Available fish solubles supply	129,723	118,980

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

* * * * *

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

Major Indicators for U. S. Supply, January 1963: United States fish meal and fish oil production in January 1963 was lower by 26.8 percent and 46.2 percent, respectively, as compared with January 1962. Fish solubles production decreased 8.4 percent.

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

Item and Period	1963	1962	1961	1960	1959
	. . . . . (Short Tons)				
Fish Meal:					
Production 1/:					
March	-	2,495	2,751	2,955	2,122
February	-	2,066	2,071	1,923	2,128
January	2,000	2,732	2,723	2,443	3,095
Jan.-Dec. prelim. totals 2/	-	288,336	289,039	257,969	275,396
Jan.-Dec. final tots.	-	-	311,265	290,137	306,551
Imports:					
March	-	18,528	20,458	18,652	16,719
February	-	18,819	14,344	8,081	19,463
January	-	25,427	9,531	8,571	19,700
Jan.-Dec.	-	252,307	217,845	131,561	132,925
Fish Solubles:					
Production 3/:					
March	-	1,903	2,564	2,462	2,382
February	-	1,566	1,650	1,812	2,211
January	1,500	1,637	1,800	1,697	1,913
Jan.-Dec.	-	123,402	112,241	98,929	165,359
Imports:					
March	-	308	135	87	410
February	-	2,249	155	1,875	398
January	-	273	219	214	1,567
Jan.-Dec. totals	-	6,308	6,739	3,174	26,630
	. . . . . (1,000 Gallons)				
Fish Body Oils:					
Production:					
March	-	42	63	66	42
February	-	49	44	51	38
January	50	93	55	46	64
Jan.-Dec. prelim. totals 4/	-	33,178	33,471	26,690	24,418
Jan.-Dec. final tots.	-	-	34,409	27,853	24,945
Exports:					
March	-	2,556	753	421	600
February	-	2,886	2,327	3,177	999
January	-	679	1,793	276	898
Jan.-Dec.	-	16,407	16,331	19,154	19,264

1/Does not include crab meat, shrimp, and misc. meals.
2/Preliminary data computed from monthly data. Fish meal production reported currently comprised 90 percent for 1959, 89 percent for 1960, and 92 percent for 1961.
3/Includes homogenized fish.
4/Preliminary data computed from monthly data. Represents over 95 percent of the total production.
Note: Data for 1962 and 1963 are preliminary.

* * * * *

Production, December 1962: In December 1962, production of fish meal (2,349 tons) was only a fraction of the 12,763 tons produced in December 1961. Oil production also followed this pattern--only 78,099 gallons in December 1962 compared with 1.5 million gallons for December 1961. Bad weather over coastal North Carolina was responsible for the failure of the menhaden fishery in December 1962. Production of fish solubles and homogenized condensed fish in December 1962 was considerably less than in December 1961.

Table 1 - U. S. Production of Fish Meal, Oil, and Solubles, December 1962[1/] with Comparisons

Product	December		Total	
	1/1962	1961	1/1962	1961
	(Short Tons)			
Fish Meal and Scrap:				
Herring	-	-	3,543	5,268
Menhaden[2/]	308	9,407	243,839	247,551
Sardine, Pacific	-	650	743	2,518
Tuna and mackerel	1,463	2,053	20,874	21,243
Unclassified	578	653	19,337	14,757
Total	2,349	12,763	288,336	291,337
Shellfish, marine-animal meal and scrap	3/	3/	3/	19,928
Grand total meal and scrap	3/	3/	3/	311,265
Fish solubles	1,481	4,596	112,764	100,551
Homogenized condensed fish	132	340	10,651	11,690
	(Gallons)			
Oil, body:				
Herring	-	-	666,503	818,017
Menhaden[2/]	8,913	1,352,942	30,548,560	31,355,570
Sardine, Pacific	-	24,844	23,589	86,167
Tuna and mackerel	44,724	86,639	621,903	762,509
Other (including whale)	24,462	27,492	4/1,317,612	1,386,542
Total oil	78,099	1,491,917	33,178,167	34,408,805

1/Preliminary data.
2/Includes a small quantity produced from thread herring.
3/Not available on a monthly basis.
4/Includes estimates for those firms which do not normally report on a monthly basis.

Inventions

NEW FISH HOOK EXTRACTING DEVICE PATENTED:

The inventor of a new fish hook extracting device claims it will remove a fish hook without tearing the body of a fish. It is said to be simple, effective, and inexpensive. (Patent Number 3,027,676, U. S. Patent Office Classification Number 43-43.16, granted Earl Buttemeier, 4411 N. Greenview, Chicago 40, Ill.)

Maine Sardines

CANNED STOCKS, JANUARY 1, 1963:

Current canned stocks reflect the 1962 comeback of the Maine sardine after the drastic decline in the catch and pack in 1961. Canners' stocks of Maine sardines on Jan. 1, 1963, were 948,000 cases greater than those of Jan. 1, 1962, but only 63,000 cases above stocks on hand two years ago on Jan. 1, 1961. Distributors' stocks of canned Maine sardines were up 23.8 percent from stocks on hand Jan. 1, 1962, and 2.6 percent from those on hand Jan. 1, 1961.

On April 15, 1962, carryover stocks at the canners' level amounted to about 33,000 cases. Adding the 1962 season pack of 2,116,000 cases results in a total supply of 2,149,000 cases as of January 1, 1963--up 89.8 percent from the total supply reported January 1, 1962, but down 7.9 percent from the total supply on January 1, 1961. Shipments between April 15, 1962 and January 1, 1963, amounted to 1,057,000 cases, up slightly from shipments of 988,000 cases during the comparable period in the previous year.

Table 2 - U. S. Foreign Trade in Selected Industrial Products, December 1962 1/ with Comparisons

Product	Oct.		Nov.		Dec.		Total	
	1/1962	1961	1/1962	1961	1/1962	1961	1/1962	1961
	(Short Tons)							
Imports:								
Fish meal and scrap	12,732	9,425	11,904	25,649	18,977	23,268	252,307	217,845
Fish solubles	290	110	435	3,649	387	472	6,308	6,739
	(Gallons)							
Whale oil, sperm (crude and refined)	-	2,318,044	3,674,921	92,756	516,413	458,027	8,932,083	7,807,625
	(Pounds)							
Exports:								
Fish and fish liver oils	219,241	15,201,869	171,127	1,424,773	171,813	10,484,236	123,049,705	122,485,721
Whale and sperm oil	30,300	49,452	3,328	902,160	705,704	84,110	2,696,522	1,205,674

1/Preliminary data.

Although the 1962 production of fish meal and oil was somewhat less than in 1961, the producers had a satisfactory year. Fish meal manufactured in 1962 totaled 288,336 tons--about 3,000 tons less than in 1961. The yield of oil (33 million gallons) was about 1.2 million gallons less than during the previous year. The year's production of fish solubles (112,764 tons) was heavier than the amount reported in 1961 (100,551 tons). Homogenized condensed fish production in 1962 amounted to 10,651 tons--about 1,000 tons less than in the previous year.

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

Type	Unit	1/1/63	1/1/62	1/1/61
Distributors . . .	actual cases	239,000	193,000	233,000
Canners	std. cases[1/]	1,092,000	144,000	1,029,000

1/100 3¾-oz. cans equal one standard case.
Source: [4]U. S. Bureau of the Census, Canned Food Report, January 1, 1963.

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

Item	1963	1962	1961
	.... (Std. Cases 1/)		
Canners' carryover stocks on April 15 2/	33,000	457,000	335,000
Season pack 2/	2,116,000	675,000	1,998,000
Total supply as of Jan. 1 .	2,149,000	1,132,000	2,333,000

1/ 100 3¾-oz. cans equal one standard case.
2/ The usual legal packing season in Maine, extending from April 15 to Dec. 1, was in effect during the 1960 and 1961 season. The 1962 season was extended to 13 months--Dec. 2, 1961-Jan. 1, 1963--but the 1962 pack canned before April 15 was insignificant.

North Pacific

Exploratory Fishery Program

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

M/V "John N. Cobb" Cruise 57: The ninth in a series of cruises designed to study deep-water marine fauna at stations established along a track line southwest of the mouth of

The U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb.

the Columbia River was completed on February 6, 1963, by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb. The trip was part of a cooperative study with the Atomic Energy Commission. Six of the cruises in the series were made by the Bureau's chartered vessel Commando and three were made by the John N. Cobb.

A standard 400-mesh eastern commercial otter trawl with a small-mesh liner in the cod end was used to sample fauna at all 18 stations (with the exception of the 275-fathom station) out to 450 fathoms. Because of adverse weather conditions, the vessel was able to study only one station (1,000 fathoms) of the nine stations at depths greater than 450 fathoms.

Sablefish (Anoplopoma fimbria), turbot (Atheresthes stomias), ocean perch (Sebastodes alutus), dogfish (Squalus acanthias), rex sole (Glyptocephalus zachirus), and Columbia River smelt (Thaleichthys pacificus) were the species of vertebrates found in greatest abundance at the stations surveyed. Columbia River smelt and rex sole dominated the catches from 50 to 100 fathoms, while ocean perch and dogfish dominated the catches from 125 to 175 fathoms. A relatively large catch (1,426 pounds of ocean perch and 1,056 pounds of dogfish per hour of trawling) occurred at the 150-fathom station. Sablefish was the main species caught between 200 and 450 fathoms. Turbot was found to be plentiful in the 175 to 250 fathom range and the idiot rockfish (Sebastolobus) from 350 to 450 fathoms. The most striking difference noted in the fish fauna during the cruise as compared to previous cruises was the small amount of Dover sole (Microstomus pacificus) in all the catches and the dominance of smelt and dogfish at the shallower stations.

In addition to sampling the fauna at each station, bottom temperatures, salinities, and bottom core samples were taken. The core samples were frozen for analysis by the Oceanography Department of the University of Washington.

Samples of fish collected for the Atomic Energy Commission were delivered to the Laboratory of Radiation Biology, University of Washington.

Over 1,000 sablefish and a few Dover sole were tagged by personnel from the Oregon Fish Commission who were aboard the vessel during part of the survey.

Also, the study on marine bacteria by personnel from the College of Fisheries, University of Washington was continued.

Note: See Commercial Fisheries Review, February 1962 p. 42.

Oceanography

NEW RESEARCH SUBMARINE:

The U. S. Fish and Wildlife Service's first submarine, a 2-man, 12-foot research vessel,

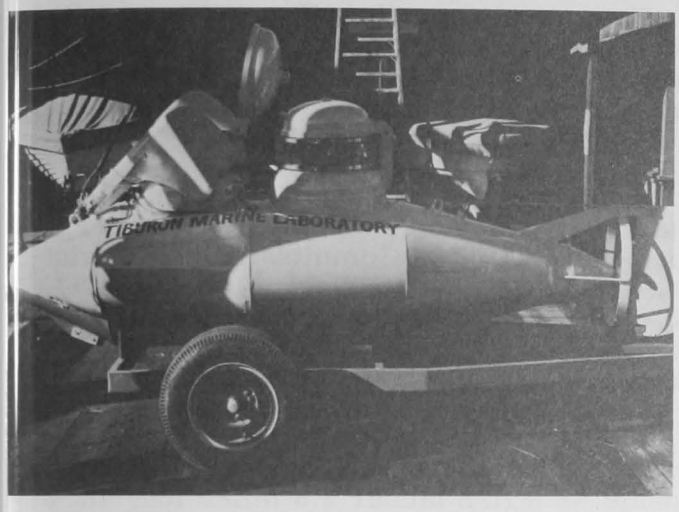


Fig. 1 - This 1-ton, 12-foot undersea research vessel can be hauled by trailer between fishery research assignments.

was delivered to the Fish and Wildlife Service Marine Laboratory at Tiburon, Calif., on February 18, 1963. Valued at about $9,000, it is destined for a major role in undersea studies by the Bureau of Sport Fisheries and Wildlife.

The torpedo-shaped craft is a "dry" submarine. This means that the occupants--one operator and one passenger--are enclosed and protected from the sea. A major

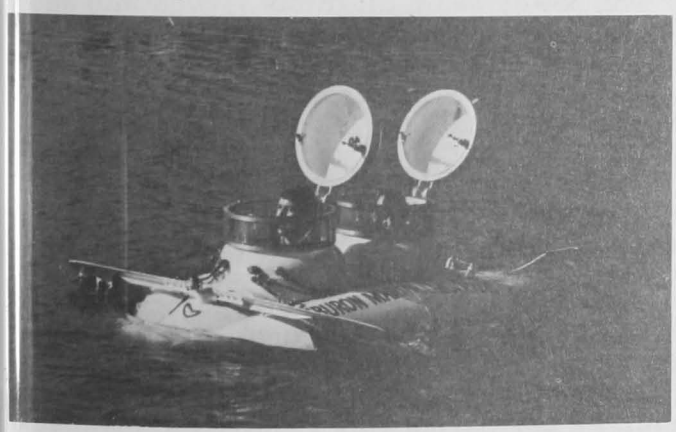


Fig. 2 - Two biologists from the Laboratory make a trial run in the 12-foot undersea research vessel.

problem in marine game fish research has been the inability of scientists to enter the undersea environment safely to make direct observations. By using the new battery-powered submarine, research biologists will now be able to accompany electronic and photographic equipment under water to record and observe marine creatures for extended periods.

Capable of operating to depths of 300 feet, the 2,000-pound underwater craft offers each occupant 360 degree viewing. It is radio-equipped and can cruise submerged for 10 hours at speeds ranging from 2 to 6 knots.

The submarine will be used for observing schooling and feeding behavior of fish, surveys of bottom conditions, locating concentrations of fish, and studies of shark behavior.

There are two conning towers on the submarine, one for each occupant. The front tower is canted forward and down to provide increased visibility directly ahead of the craft and of the sea bottom. The submarine is controlled by an airplane-type stick which permits rapid movement of hydroplanes and rudder at all speeds. Ballast tank controls and trim tanks permit the submarine to operate at positive, neutral, and negative buoyancy. It has two forward and two reverse speeds. An air filter system removes carbon dioxide, permitting the occupants to breath clean air.

* * * * *

SECOND FOLIO OF NORTH ATLANTIC MARINE ENVIRONMENT SERIAL ATLAS:

Some 96,000 temperature readings taken at a depth of 200 meters throughout the North Atlantic Ocean have been organized and their distributions mapped in an atlas Folio issued on March 7, 1963, by the American Geographical Society.

The Folio is the second in a series being published by the Society under the general title, "Serial Atlas of the Marine Environment." The new Folio is the work of a scientist of the Woods Hole Oceanographic Institution, and represents data collected by the Institution as well as data from various agencies, including the National Oceanographic Data Center in Washington, D. C., and the Canadian Naval Research Establishment at Halifax, N. S.

The Folio consists of nine color plates, a brief explanatory text by the scientist, and 11 pages of statistical tables of the source data. The maps show average temperatures, maximum range of temperatures, anomalies, and seasonal distribution of the data.

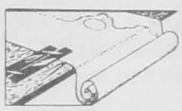
The Serial Atlas, a type of atlas never before attempted in this country, was introduced

last year with the publication of the first Folio in the series, a study of sea surface temperatures in the Western North Atlantic. The Atlas is planned to effect interdisciplinary communication, to provide scientists with an essential means of making comparative studies, and to uncover areas of ignorance as well as of knowledge.

Each Folio in the series is a complete study in itself. Thus a more comprehensive picture of all aspects of the sea (physical, biological, chemical, and geological) is expected gradually to unfold. Scientists hope that many variables, so far undetected, will be pinpointed and that guide lines for future research will emerge. Among other Folios in preparation or in prospect are temperature studies at other critical depths; the detailed bathymetry of the North Atlantic and the Arctic Basin; the directions and velocities of winds and currents in the North Atlantic; a study of the seasonal distribution of groundfish over Georges Bank and the Gulf of Maine; and an environment study of a particular species of clam, Spisula polynyma.

"The Serial Atlas of the Marine Environment" is an international project, with scientists on both sides of the Atlantic, in all disciplines dealing with the sea, participating. An advisory group will guide the project and recommend the suitability of topics.

Base maps, specially prepared by the American Geographical Society, are distributed to the contributing scientists, who use them as worksheets on which to plot and analyze their data. Contributions are then submitted to the society whose responsibility is to make final decisions regarding the form of presentations, to prepare the finished maps, and to edit the Folios for final publication.



Oregon

FISH PASSAGE FACILITIES OVER PELTON DAM EVALUATED:

A report covering an evaluation study of the fish passage facilities at a private power company's Pelton Dam on the Deschutes River was announced on February 27, by a 5-man steering committee composed of Oregon Fish Commission officials, scientists of the U. S. Bureau of Sport Fisheries and Wildlife and U. S. Bureau of Commercial Fisheries, and a representative of the power company.

The report describes the results of a 3-year study initiated in May 1959 under an agreement between the State and Federal agencies and the company, which provided the $114,000 required for the project.

Under the supervision of the Committee, the field work and data analysis were performed by the Fish Commission with assistance from the power company. Much valuable information was obtained with respect to fish passage problems as well as incidental material that will be of future value.

The permanent fish facilities at the Pelton project, which have been operable since 1958, consist of a fish ladder 2.8 miles long and a trap-and-truck combination for upstream-migrant fish. The downstream-migrant collection system at the dam introduces the fish into the ladder, which carries them to the river below the project.

Although the upstream-migrant collection system functioned satisfactorily and adult fish readily entered the trap, they were often reluctant to ascend the fish ladder during the summer months for reasons still to be determined.

The downstream migrants moved into and through the artificial outlet or "skimmer" as intended. Few wild fish left through the deeply submerged power tunnel or other possible exits.

The downstream passage efficiency for salmon was judged favorable in 1960, but seemed unfavorable in 1961. On examination of the records, however, it appeared that sufficient numbers of downstream migrants occurred to maintain the runs. But this did not appear to be true in the case of steelhead trout. In the two years examined, the one returnee per parent fish required to maintain the stocks was not achieved. This situation may or may not continue. Trends of abundance of those fish are affected by many factors other than the dam.

Counts of all fish, going both up and downstream past the Pelton project, were maintained continuously both before and since the evaluation period and will continue in the

uture. Studies of the counts will provide additional information. Following completion of the Round Butte project immediately upstream, further evaluation of the Pelton fish passage facilities will be included in a four-year study of the Round Butte installation, which will also be financed by the power company.

* * * * *

NEW DIRECTOR OF FISHERIES RESEARCH APPOINTED:

The Oregon Fish Commission Director announced on February 20, 1963, the appointment of Dr. Donald W. Chapman as Director of Research, filling the position left by Sigurd J. Westrheim, now with the Fisheries Board of Canada in Nanaimo, B.C.

Chapman received his Bachelor of Science degree in Forest Management from Oregon State University in 1953, Master of Science degree in Fisheries, 1957, Oregon State University, and Ph.D. in Fisheries, 1961, also from Oregon State.

A veteran, Chapman has served as Research Assistant with the Oregon Cooperative Wildlife Research Unit; Coordinating Biologist for the Governor's Natural Resources Committee; and Coordinator, Alsea Watershed Study. At the time of his appointment he was an Assistant Professor of Fish and Game Management at Oregon State University. Since December 1960, Chapman has also been Executive Secretary of the Water Resource Research Institute.

Several of Chapman's writings dealing mainly with stream ecology as it pertains to silver salmon and steelhead have appeared in professional scientific journals. He will be headquartered at Clackamas, the Commission's main research center.

Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, FEBRUARY 1963:

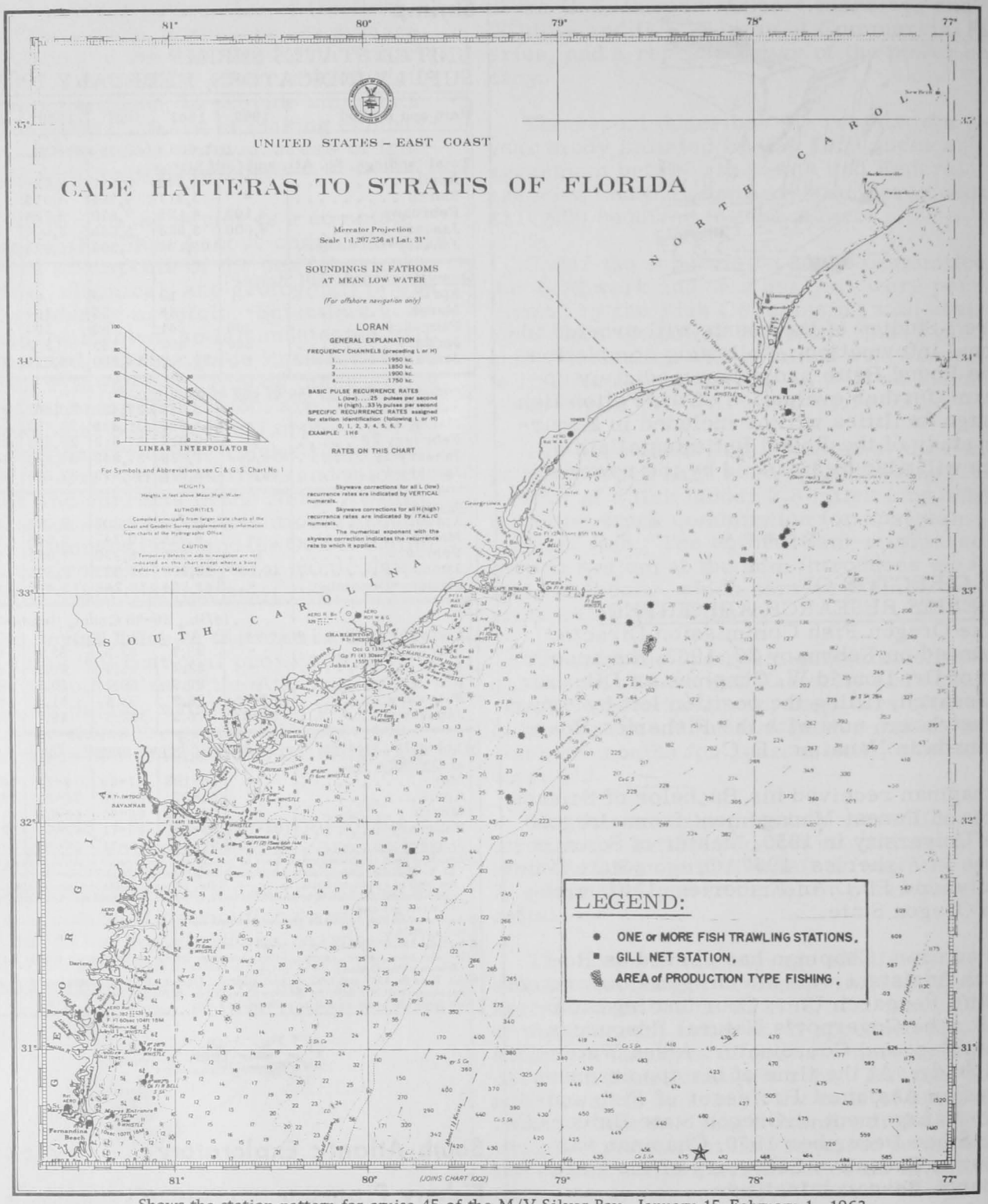
Item and Period	1963	1962	1961	1960	1959
			(1,000 Lbs., Heads-Off)		
Total landings, So. Atl. and Gulf States:					
April	-	3,349	3,171	4,728	3,595
March	-	3,317	4,754	4,099	2,950
February	4,100	4,125	3,910	3,784	3,227
January	4,000	3,828	5,686	5,402	4,308
January-December	-	105,100	91,396	141,035	130,660
Quantity canned, Gulf States 1/:					
April	-	12	9	66	74
March	-	86	35	117	85
February	300	241	90	204	124
January	540	492	183	266	283
January-December	-	23,210	14,500	26,394	22,659
Frozen inventories (as of end of each mo.) 2/:					
April 30	-	15,637	27,492	20,502	23,331
March 31	-	16,607	31,345	23,232	24,893
February 28	3/	19,012	37,612	29,063	27,555
January 31	4/29,263	21,328	37,842	34,332	30,858
January 1	31,577	28,372	40,913	37,866	32,844
Imports 5/:					
April	-	10,219	9,208	7,733	9,051
March	-	9,658	10,347	8,545	8,492
February	3/	10,599	8,932	7,657	7,481
January	13,139	12,907	12,338	8,596	8,238
January-December	-	141,384	126,268	113,418	106,555
			(¢/lb., 26-30 Count, Heads-Off)		
Ex-vessel price, all species, So. Atl. & Gulf Ports:					
May	-	83.7	52.8	62.9	63.3
April	-	82.2	55.4	60.6	65.2
March	-	80.9	56.0	56.3	67.6
February	87-95	78.9	53.5	51.8	69.6
January	86-93	76.3	52.5	49.4	70.9
Wholesale price for froz. domestic brown species (5-lb. pkg.) at Chicago, Ill.:					
May	-	96-103	67-69	74-77	70-76
April	-	94-97	69-76	74-75	75-82
March	-	94-95	69-71	65-68	81-83
February	102-106	93-95	69-71	65-67	82-87
January	102-106	91-94	69-71	64-66	86-88

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3. (Data for canned shrimp beginning with February 1963 have been revised on the basis of a new conversion factor--30.3 lbs. per case. Data for January 1963 and preceding months were determined by multiplying the number of standard cases by 33.0 lbs. per case.)
2/Raw headless only; excludes breaded, peeled and deveined, etc.
3/Not available.
4/Includes 397,000 pounds for firms not reported previously.
5/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
Note: Data for 1963 and 1962 are preliminary. February 1963 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

South Atlantic Exploratory Fishery Program

EXPLORATORY TRAWLING FOR COMMERCIAL SPECIES OFF NORTH AND SOUTH CAROLINA CONTINUED:

M/V "Silver Bay" Cruise 45 (January-February 1, 1963): The assessment of the seasonal availability to otter trawls of snap-



Shows the station pattern for cruise 45 of the M/V Silver Bay, January 15-February 1, 1963.

ers, groupers, and other commercially valable species, was continued during an 18-day cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay.

Catches of commercial species off Cape Romain, S. C., in 14 to 24 fathoms ranged from 525 to 3,057 pounds per 90-minute drag. Best fishing was in 20 to 24 fathoms where consecutive drags yielded a total marketble catch of 15,396 pounds of fish. Additional drags in 17 to 18 fathoms yielded catches of from 280 to 900 pounds of small (2 to 3 pound average) vermillion snapper (Rhomboplites aurorubens).

Scup (Stenotomus chrysops) averaging three to the pound dominated the catches off Southport, N. C. Best catches in that area were at depths of 17 to 18 fathoms, where they averaged over 1,000 pounds. Catches ranging from 260 to 2,000 pounds of scup were obtained from 90-minute drags.

Off Cape Romain, a roller-rigged 80/100-foot nylon fish trawl was fished with 10-foot bracket doors. Off Southport, a 70/90-foot nylon trawl was fished with 8-foot bracket doors and spacers rather than rollers on the footrope. Fishing was carried out mostly in daylight hours, and drags were made when whiteline recorder tracings indicated presence of fish.

In addition to trawling operations, three surface gillnet sets were made, with little success; and 370 sea-bed and 370 sea-surface drift bottles were released at 10-mile intervals in cooperation with personnel of the Bureau's Biological Laboratory at Beaufort, N. C.

Note: See Commercial Fisheries Review, October 1962 p. 30.

Storm Warnings

FASTER WARNINGS MADE POSSIBLE BY NEW COMPUTING DEVICE:

A storm radar data processor called STRADAP has been developed to replace time-consuming interpretation and transmission of radar storm data. The new electronic setup produces storm maps showing the intensity and height of a storm. The intensity of a storm is rated on a numbered scale of 1 to 7. Storm tops are shown on another map scaled in units of 10,000 feet. It is planned to use STRADAP to transmit storm information from all parts of the country to a national center in less than 20 minutes. (Science News Letter, February 2, 1963.)

Tagging

RADIONUCLIDES OFFER POSSIBILITIES FOR FISH MARKING:

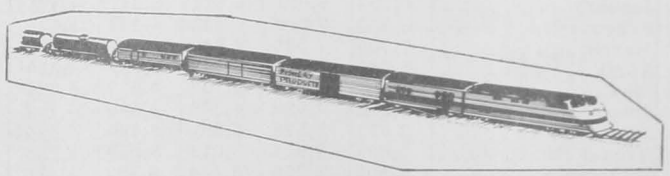
Fish marking possibilities using radionuclides are being studied by Atomic Energy Commission biologists at the Oak Ridge National Laboratory. The project involves collecting fish from the Clinch River, Tenn., above Watts Bar Reservoir, where they are exposed to low level radioactive wastes from the Laboratory.

Radionuclides are accumulated by the fish either directly or through the food chain. Autoradiography of fish scales showed localized rings of radioactivity which presumably were associated with the fish's growth when they were in areas contaminated by radioactive wastes. The possibility appears that these rings may be used as a marking technique. The development of radionuclide tagging where fish would be marked without being handled, impaired, or injured could provide a means of study without altering fish behavior or growth.

Transportation

EASTERN RAILROADS SEEK INCREASED ICE AND SALT CHARGES:

The railroads in the Eastern territory have petitioned the Interstate Commerce Commission for permission to increase their charges for ice by $8\frac{1}{2}$ percent and their charges for



salt by 6 percent. The charges apply to shipments of fish and certain other products. The increase would raise the present cost of ice from $6.91 per ton to $7.50 a ton and the cost of salt from $1.04 per cwt. to $1.10 per cwt.

The railroads asked that the charges be increased immediately subject to a later investigation. If the entire increase is not ultimately approved, the railroads would voluntarily refund the excess collected in the interim.

United States Fisheries

FISH STICKS AND PORTIONS PRODUCTION, OCTOBER-DECEMBER 1962:

United States production of fish sticks amounted to about 19.0 million pounds and that of fish portions was 22.4 million pounds during the fourth quarter of 1962, according to preliminary data. This was a gain of nearly 5.1 percent in fish sticks and 26.2 percent in portions as compared with the same quarter of 1961.

Cooked fish sticks (17.5 million pounds) made up 92.3 percent of the fish stick total. The remaining 7.7 percent consisted of raw fish sticks. A total of 21.6 million pounds of breaded fish portions (of which 17.4 million pounds were raw) and 826,000 pounds of unbreaded portions were processed during the fourth quarter of 1962.

Plants on the Atlantic Coast produced the bulk of the fish sticks and portions--27.8 million pounds. The Gulf and Inland States produced 11.1 million pounds, and the Pacific Coast States, 2.4 million pounds.

During 1962, fish stick production of 71.7 million pounds was up 2.7 percent, and the fish portions production of 77.7 million pounds was up 29.8 percent as compared with 1961.

Table 1 - U.S. Production of Fish Sticks by Months and Type, October-December 1962 1/

Month	Cooked	Raw	Total
	(1,000 Lbs.)		
October	6,118	557	6,675
November	5,788	487	6,275
December	5,601	408	6,009
Total 4th Quarter 1962 1/	17,507	1,452	18,959
Total 4th Quarter 1961	16,834	1,205	18,039
Total 1962 1/	66,556	5,177	71,733
Total 1961	65,006	4,818	69,824

1/Preliminary.

Table 2 - U. S. Production of Fish Sticks by Areas, October-December 1962 and 1961

Area	1/1962		2/1961	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	22	14,918	23	14,620
Inland & Gulf States	5	2,368	7	1,934
Pacific Coast States	10	1,673	9	1,485
Total	37	18,959	39	18,039

1/Preliminary. 2/Revised.

Table 3 - U.S. Production of Fish Sticks by Months, 1958-62

Month	1/1962	2/1961	1960	1959	1958
	(1,000 Lbs.)				
January	6,104	6,091	5,511	6,277	5,471
February	6,859	7,092	6,542	6,352	5,925
March	7,706	7,233	7,844	5,604	5,526
April	5,480	5,599	4,871	4,717	4,855
May	5,609	5,129	3,707	4,407	4,229
June	5,058	4,928	4,369	4,583	4,702
July	3,613	3,575	3,691	3,790	4,574
August	5,696	6,927	5,013	3,879	4,358
September	6,506	5,206	5,424	5,353	5,328
October	6,675	6,133	6,560	5,842	5,485
November	6,275	6,288	6,281	4,831	5,091
December	6,009	5,618	5,329	4,743	5,467
Total	71,590	69,819	65,142	60,378	61,011

1/Preliminary. 2/Revised.

Table 4 - U. S. Production of Fish Portions by Months and Type, October-December 1962 1/

Month	Breaded			Unbreaded	Total
	Unbreaded	Raw	Total		
	(1,000 Lbs.)				
October	1,805	7,165	8,970	355	9,325
November	1,067	5,933	7,000	281	7,281
December	1,259	4,338	5,597	190	5,787
Tot. 4th Qtr. 1962 1/	4,131	17,436	21,567	826	22,393
Tot. 4th Qtr. 1961	3,518	13,564	17,082	657	17,739
Total 1962 1/	13,874	61,431	75,305	2,406	77,711
Total 1961	11,003	46,783	57,786	2,061	59,847

1/Preliminary.

Table 5 - Production of Fish Portions by Areas, October-December 1962 and 1961

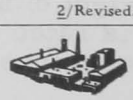
Area	1/1962		2/1961	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	23	12,930	24	9,87
Inland & Gulf States	11	8,775	12	7,56
Pacific Coast States	7	688	6	3
Total	41	22,393	42	17,7

1/Preliminary. 2/Revised.

Table 6 - U. S. Production of Fish Portions by Months, 1958-1962

Month	1/1962	2/1961	1960	1959	1958
	(1,000 Lbs.)				
January	5,102	4,303	3,632	2,692	1,97
February	6,374	4,902	3,502	3,025	1,25
March	6,931	5,831	4,706	3,225	1,47
April	6,350	4,484	3,492	2,634	2,26
May	5,749	3,879	3,253	2,684	1,47
June	6,082	4,039	3,995	3,247	1,50
July	4,706	3,962	4,088	2,227	2,16
August	6,662	4,963	3,558	2,796	1,51
September	7,159	5,745	4,631	3,558	1,56
October	9,325	6,759	5,275	4,314	2,56
November	7,281	5,789	4,790	3,483	1,97
December	5,787	5,191	4,459	3,262	2,06
Total	77,508	59,847	49,381	37,147	21,79

1/Preliminary. 2/Revised.



J. S. Fishing Industry

LOANS TO FISHERY FIRMS:

Sixty loans totaling $4.5 million have been nade to fishery products processors by the mall Business Administration (SBA) of the U.S.)epartment of Commerce since enactment of he Small Business Act in 1953. In addition, BA has made about 40 loans totaling $2.8 mil- on to wholesale and retail fish distributors.

J. S. Fishing Vessels

)OCUMENTATIONS ISSUED AND ANCELLED, JANUARY 1963:

Table 1- U.S. Fishing Vessels 1/ --Documentations Issued nd Cancelled, by Areas, January 1963 with Comparisons

Area (ome Port)	January 1963	January 1962	Total 1962
		. . .(Number). . .	
ssued first documents 2/:			
New England	1	2	28
Middle Atlantic	1	-	3
Chesapeake	-	4	43
South Atlantic	2	2	47
Gulf	12	10	110
Pacific	4	6	130
Great Lakes	-	-	5
Puerto Rico	-	-	2
Total	20	24	368
emoved from documentation 3/:			
New England	1	2	24
Middle Atlantic	4	8	39
Chesapeake	1	2	23
South Atlantic	7	3	38
Gulf	5	13	104
Pacific	7	16	111
Great Lakes	2	5	22
Hawaii	-	1	3
Puerto Rico	-	-	1
Total	27	50	365

or explanation of footnotes, see table 2.

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

oss Tonnage	Issued 2/	Cancelled 3/
	. . .(Number). . .	
5-9	5	7
0-19	6	7
0-29	-	2
0-39	1	3
0-49	1	1
0-59	5	1
0-69	1	2
0-79	1	1
0-89	-	1
0-129	-	1
0-249	-	1
Total	20	27

Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
There were no redocumented vessels in January 1963 previously removed from records. Vessels issued first documents as fishing craft were built: 1 in 1963; 12 in 1962; 1 in 1961; 1 in 1958; and 5 prior to 1951.
Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

During January 1963, a total of 20 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 24 in January 1962. There were 27 documents cancelled for fishing vessels in January 1963 as compared with 50 in January 1962.

U. S. Foreign Trade

TRENDS IN EXPORTS OF FISHERY PRODUCTS DURING 1961:

The total value of United States exports of fishery products in 1961 was 21.4 percent below the 1960 value--exports of edible fishery products were down 23.5 percent and exports of inedible fishery products were down 18.5 percent. The decline was mainly due to reduced exports of canned and frozen salmon, canned sardines, canned shrimp, unmanufactured shells, and fish oil. The decline was partly offset by greater exports of frozen shrimp and canned mackerel.

Table 1 - Value 1/ of United States Exports of Fishery Products, 1952-1961

Year	Edible Products	Inedible Products	Total
	. . . . . (US$1,000)		
1961.	19,594	15,116	34,710
1960.	25,622	18,543	44,165
1959.	26,747	17,495	44,242
1958.	19,440	11,564	31,004
1957.	20,549	15,403	35,952
1956.	22,939	16,564	39,503
1955.	24,923	15,054	39,977
1954.	16,238	15,289	31,527
1953.	17,084	10,794	27,878
1952.	15,511	6,436	21,947

1/Value at point of exportation.

Table 2 - Value 1/ of United States Exports of Fishery Products by Selected Commodities, 1957-61

Commodity	1961	1960	1959	1958	1957
	. . . . . (US$1,000).				
Fish oils	8,908	10,688	11,902	7,761	10,760
Seal furs	3,097	3,309	2,580	1,511	2,455
Shells unmanufactured	1,380	2,636	977	624	775
Oysters, shucked	448	497	575	567	589
Salmon:					
Fresh or frozen	647	1,677	659	476	446
Cured	593	435	372	357	226
Canned	5,580	9,830	10,639	6,669	4,740
Mackerel, canned	581	211	135	333	2,146
Sardines:					
Canned, not in oil	1,336	3,443	5,843	3,231	2,654
Shrimp:					
Fresh or frozen	3,694	2,303	1,682	1,463	1,471
Canned	2,487	3,383	2,898	2,548	2,410
Squid, canned	353	691	906	501	2/
Miscellaneous fish:					
Fresh or frozen	809	947	622	1,036	973
Canned	391	355	326	496	2,137

1/Value at point of exportation.
2/Squid was included with "other shellfish" prior to 1958.

During 1961, United States fishery products were exported to 105 countries. Canada, the United Kingdom, Japan, Norway, and the

Netherlands (leading buyers of fishery products from the United States) accounted for 65.0 percent of the value of fishery exports (table 3). There was a substantial decline in exports to most leading markets except Canada, France, and Norway.

Table 3 - Value[1/] of United States Exports of Fishery Products by Selected Countries of Destination, 1957-61

Country	1961	1960	1959	1958	1957
	(US$1,000)				
United Kingdom	4,554	8,460	8,928	5,785	3,708
Canada	10,265	10,309	8,644	9,200	7,253
Philippines	582	2,494	5,587	2,578	6,027
Netherlands	2,385	4,350	4,352	2,007	2,969
Sweden	1,665	2,613	3,176	681	1,844
West Germany	1,555	2,201	2,888	3,043	5,099
Norway	2,390	1,390	1,296	1,063	970
Japan	2,984	3,295	928	501	669
Mexico	459	616	663	393	175
Cuba	-	175	787	490	721
Venezuela	360	461	614	641	573
Belgium and Luxembourg	351	537	746	948	447
France	1,007	1,048	766	68	259
Switzerland	738	1,082	762	387	463
Italy	423	643	303	158	259
Greece	364	313	306	136	195
Other countries	4,628	4,178	3,496	2,925	4,321
Total	34,710	44,165	44,242	31,004	35,952

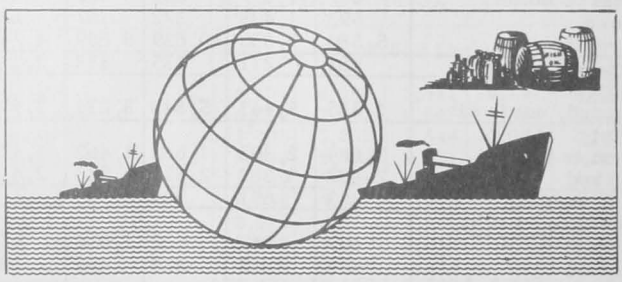
1/Value at point of exportation.

Canada was the leading foreign market for United States fishery products in 1960 and 1961.

Table 4 - Value of United States Exports of Fishery Products to Canada, 1961

Fish and marine animal oils	$ 1,333,000
Seal furs	1,777,000
Shrimp, fresh or frozen	1,676,000
Shrimp, canned	1,570,000
Salmon, canned	918,000
Fish, fresh or frozen	891,000
Oysters, shucked	428,000
Other	1,672,000
Total	$10,265,000

The United Kingdom ranked second as a buyer of United States fishery products, but the value of fishery exports to the United Kingdom in 1961 was down 46.1 percent from



that in 1960. The decline was mainly due to a drop in exports of frozen and canned salmon and canned shrimp. On the other hand, exports of fish oil to the United Kingdom became important for the first time in 1961.

Table 5 - Value of United States Exports of Fishery Products to the United Kingdom, 1961

Salmon, canned	$3,056,000
Shrimp, canned	557,000
Salmon, fresh or frozen	141,000
Fish and marine animal oils	568,000
Other	232,000
Total	$4,554,000

Exports to Norway, Sweden, West Germany and the Netherlands consisted mainly of fish oils. The main products exported to Japan were frozen shrimp and unmanufactured shells. France bought frozen salmon, canned shellfish, seal furs, fish oils, and fish-liver oils.

Trend by Commodities: The principal fishery products exported by the United States in 1961 were fish oils, frozen shrimp, and canned salmon.

Fish Oil: In 1961, the value of exports of fish oil was noticeably less than in 1959 and 1960 in spite of the fact that the United States production during 1961 was the largest since 1939.

Canned salmon: In 1961, the value of exports of canned salmon was down 43.2 percent from 1960. The decline was partly due to a reduced domestic pack.

Shrimp: In 1961, the value of exports of frozen shrimp was 60.4 percent greater than in 1960, but the value of exports of canned shrimp was down 26.5 percent. Japan and Canada were the leading buyers of United States shrimp. (Does not include a substantial amount of re-exports, principally to Japan.)

Other Canned Fishery Products: In 1961, exports of canned sardines and canned squid declined to less than half their 1960 value. On the other hand, 1961 export shipments of canned mackerel and anchovies were about triple those of 1960.

Virginia

BIOLOGIST TO COLLECT FISH PARASITES FROM INDIAN OCEAN:

A biologist of the Virginia Institute of Marine Science, left March 1, 1963, for the Indian Ocean where he will collect fish parasites during the next three months. He will be a member of the first cruise of the International Indian Ocean Expedition. All expenses, including scientists' salaries, are being paid by the U. S. National Science Foundation.

The International Indian Ocean Expedition sponsored by the United Nations Economic,

Scientific, and Cultural Organization (UNESCO), is a scientific endeavor primarily concerned with obtaining biological, chemical, geological, and physical information about land, ocean, and atmospheric conditions in the Indian Ocean area. At least 12 nations are participating in this important effort.

The biologist will participate in the first of 8 three-month cruises planned under the program. His work will be the collection of various fish species for a study of parasites. The project will aid in furthering worldwide studies of host-specificity of fish parasites.

The Virginia Institute Marine Laboratory has fish parasite collections from the western North Atlantic, Chesapeake Bay, Caribbean, Gulf of Mexico, Chile, New Zealand, Australia, and Antarctica. During recent years the Institute has been investigating a theory that fish parasites may act as natural tags and serve to indicate fish migrations.

* * * * *

STUDIES OF RADIOACTIVE WASTES IN BAY WATERS TO BE CONTINUED:

Studies on the role of filter feeding organisms in removing radioactive wastes from river and bay waters by scientists of the Virginia Institute of Marine Science are to be financed for the third consecutive year by a grant of $20,000 from the Atomic Energy Commission.

The Virginia marine scientists were among the first to consider the role of living organisms in removing suspended radioactive particles from the water. Scientists earlier held that suspended materials would likely soon be flushed from the system by strong seaward currents. According to the Institute's scientists, their studies show that radionuclides become strongly attached to suspended silt and clay particles. During normal feeding, oysters filter out tiny living plankton organisms along with other suspended and non-living particles.

After filtration this material is mixed with mucous substance and deposited in compacted clumps on the bottom. The problem of what happens to radionuclides associated with clay and silt particles included in this mass thereafter assumes great importance.

The scientists reported that although some of the radioactive material is incorporated into the oyster's flesh and shell or redissolved in the water, most of it remains on the particles and is deposited in the bottom sediments. Much of this may subsequently be washed away by strong currents, but there is concern over amounts carried down into bottom layers by natural phenomena or by animals, such as worms, that live in bottom layers. When carried deep into the bottom by these organisms, the radioactive particles are no longer subject to transport by water movements.

In addition to oysters, the Virginia scientists will study removal of suspended particles by other filter feeders. Barnacles, clams, mussels, and tunicates (sea squirts) will be added to the 1963 phase of the project and silt particles will be "tagged" with a fluorescing dye to learn of their final disposition.

"Information provided by studies of this type are valuable in knowing what steps may have to be taken to preserve our valuable marine resources in the event of an accidental discharge of radioactive materials into the marine system," one of the Institute's scientists reported. "The increasing use of nuclear reactors by the military and in industry makes these investigations a growing phase of marine laboratory programs as we contine to adapt atomic energy for human progress."

Problems of possible radioactive contamination of various phases of the marine environment are but one facet of the ever increasing degradation to which natural waters are being subjected by the activities of man. Only by acquisition of adequately detailed scientific knowledge will it be possible to minimize destruction of this resource which is so important to society.

Wholesale Prices

EDIBLE FISH AND SHELLFISH, FEBRUARY 1963:

Wholesale prices for edible fish and shellfish (fresh, frozen, and canned) in February this year dropped 2.9 percent from January 1963 due primarily to lower ex-vessel prices for fresh drawn haddock and a drop in prices for fresh haddock fillets and frozen dressed halibut. Supplies of groundfish landed at New England ports began to improve in late winter, and stocks of frozen dressed halibut from the 1962 Pacific fishing season were higher than normal. Compared with the same month a year ago, wholesale prices for fishery products this February were lower by 1.1 percent due mainly to lower first hand prices for fresh haddock fillets and canned fish products.

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

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1957-59=100)			
			Feb. 1963	Jan. 1963	Feb. 1963	Jan. 1963	Dec. 1962	Feb. 1962
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					118.4	121.9	120.9	119.7
Fresh & Frozen Fishery Products:					124.4	130.0	127.6	118.5
Drawn, Dressed, or Whole Finfish:					122.7	137.2	133.1	118.6
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.12	.21	94.6	162.9	143.8	107.4
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.43	.43	125.6	128.1	127.1	117.3
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.96	.96	133.8	134.5	135.2	120.5
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.68	.71	100.7	106.0	103.0	115.7
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.69	.54	113.0	88.5	88.5	120.4
Processed, Fresh (Fish & Shellfish):					128.5	130.4	128.5	125.4
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.41	.57	98.3	137.2	139.6	109.3
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.12	1.09	130.7	127.2	123.1	123.1
Oysters, shucked, standards	Norfolk	gal.	7.75	7.88	130.7	132.8	132.8	130.7
Processed, Frozen (Fish & Shellfish):					117.3	117.5	116.4	107.7
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.40	98.9	100.1	100.1	100.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.37	108.5	107.0	107.0	96.7
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.33	.34	115.7	117.5	117.5	119.2
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.04	1.05	123.4	123.9	122.2	112.1
Canned Fishery Products:					108.0	108.0	109.4	122.1
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.75	24.75	107.9	107.9	111.1	124.2
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.75	11.75	104.4	104.4	104.4	107.9
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	5.90	5.90	2/100.0	2/100.0	2/100.0	3/118.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.31	9.31	119.4	119.4	119.4	164.3

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

2/ One commodity has been dropped in the fishery products index as of December 1962--"Sardines, Calif., tom. pack, No.1 oval (15-oz.), 24 cans/cs."--and replaced in the fishery products index by--"Mackerel, jack, Calif., No. 1 tall (15-oz.), 48 cans/cs." Under revised procedures by the Bureau of Labor Statistics all new products enter wholesale price indexes at 100.

3/ Based on Calif. sardines and not directly comparable with new subgroup item (jack mackerel) for January-February 1963 and December 1962.

The drawn, dressed, and whole finfish subgroup index in February 1963 was down 11.6 percent from a month earlier, but was up (3.5 percent) from February a year ago. Much lower ex-vessel prices at Boston for fresh drawn haddock were largely responsible for the decrease from January to February this year. In addition, some weakness developed in the wholesale market for frozen dressed halibut (down 2.0 percent). From February a year ago to February this year, a decrease of 12.0 percent in the drawn fresh haddock price was more than compensated for by increases in prices for frozen dressed halibut (up 7.1 percent) and frozen dressed salmon (up 11.0 percent). Changes in fresh-water fish (whitefish and yellow pike) wholesale price indexes for January and February 1963 as compared with February 1962 were not significant due to the lack of regular supplies.

The fresh processed fish and shellfish subgroup index this February decreased 1.5 percent from a month earlier, but was up 2.5 percent from February 1962. A decrease of 28.4 percent (dropped about 16 cents a pound) in the fresh haddock fillet price at Boston plus a slightly lower fresh shucked oyster price was offset partially by a 2.8 percent increase in the fresh shrimp price at New York City. As compared with February 1962, haddock fillets this month were down 10.1 percent, but fresh shrimp prices were higher by 6.2 percent. The fresh shucked oyster price was unchanged from February a year ago to this February.

The February 1963 processed frozen fish and shellfish subgroup price index dropped slightly (less than 1/2 percent) from the preceding month because of a one-cent-a-pound decrease in the price for frozen shrimp at Chicago, plus declines of about 1/2 cent a pound in the wholesale prices for frozen flounder and ocean perch fillets. During the same period frozen haddock fillet prices increased 1.4 percent (1/2 cent a pound). Compared with the same month a year ago, the February 1963 subgroup index rose 8.9 percent due to higher frozen shrimp prices at Chicago (up 10.0 percent), but with slightly lower prices for frozen ocean perch and flounder fillets.

The canned fishery products subgroup index was unchanged from January to February 1963 and remained at 108.0 percent of the 1957-59 base. From February a year ago to this February, the subgroup index dropped 11.5 percent because of a sharply lower canned Maine sardine price (down 27.3 percent), a lower canned pink salmon price (down 13.1 percent), and a 3.3 percent drop in the canned tuna price.