



# TRENDS AND DEVELOPMENTS

## Marine Biology Laboratory in Randolph (Mass.) High School

Students in the sophomore class at Randolph High School in Randolph, Mass., a suburb of Boston, are making contributions to marine biology and oceanography through a recently well-organized oceanographic laboratory at the school. The laboratory and its procedures were set up by biology instructor Kenneth Sherman, a former employee of the U. S. Fish and Wildlife Service's Division of Biological Research. The Randolph High School laboratory copies the research methods and problem-solving techniques of the Service's biologists. It is hoped the laboratory will aid in the development of oceanographic scientists for the

future, and at the same time contribute in some small way to ocean science.

The emphasis on ocean research is recent. Here is a frontier of science to challenge the imagination of any alert student. Problems concerning every basic biological concept are present. Here is an environment that presents a great opportunity for original investigation. Little or nothing is known concerning a large number of common marine organisms, especially those which have no particular commercial importance. The physiology, morphology, and ecology of only a small number of marine organisms is now generally understood. There are many gaps in our knowledge concerning the fishes and other marine organisms of the North Atlantic coast. As a result

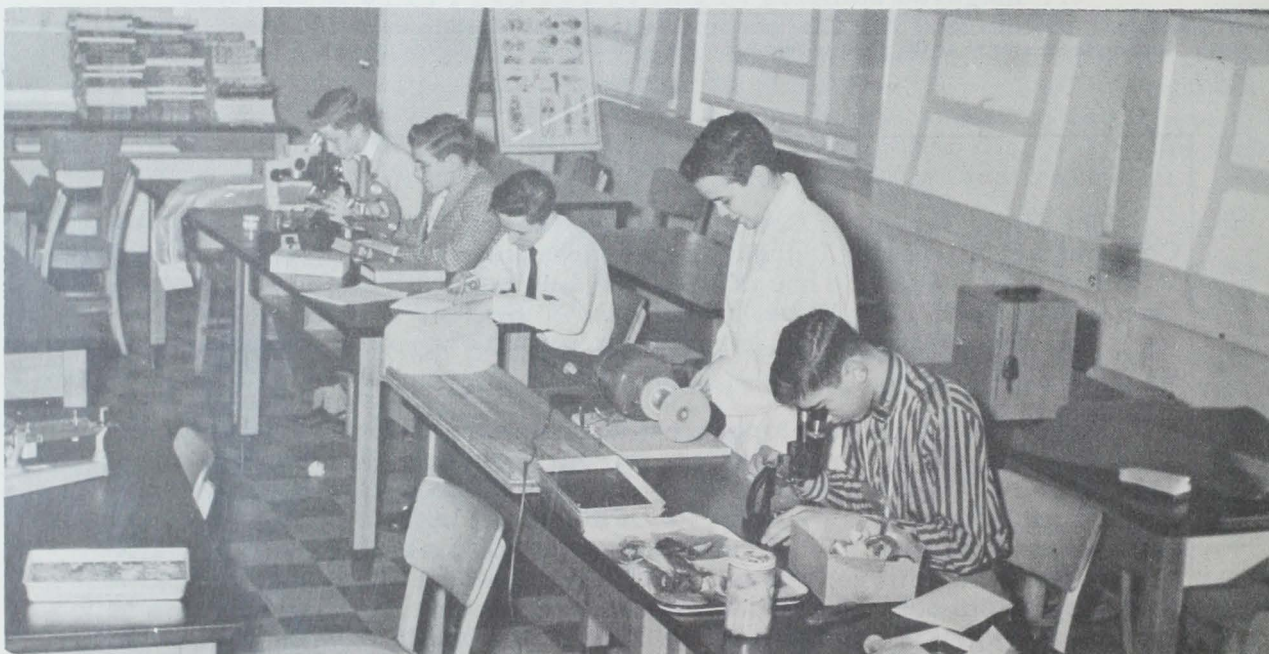


Fig. 1 - Several members of the Randolph High School oceanographic laboratory staff at work (left to right) Fred Hubble and Robert Merritt are examining plankton collected for their productivity studies. George Fahey is busy checking through the literature concerning the distribution of the tomcod, while Peter McGrath is shown grinding down a bone (otolith) taken from the skull in an effort to observe the growth pattern of annual rings similar to those found in a tree. Everett Schaner is examining the gonads as part of his fecundity study of the same fish.

of this lack of knowledge and increased interest in the oceans, the Randolph High School oceanographic laboratory was formed. The laboratory has given the participating students a unique opportunity to become familiar with research methods and problem-solving techniques.

The laboratory began with a small group of students with high aptitudes and a genuine curiosity concerning the oceans. The students were selected on a competitive basis. The five classes of sophomore biology students were given two lessons



Fig. 2 - Peter McGrath weighing a tomcod as part of his age and growth study.

concerned with the cycle of life in the ocean with particular emphasis on its origin, economic importance, and untapped resources. The students were then required to complete a report of approximately 1,500 words entitled, "The Cycle of Life in the Oceans," using at least three different reference books. Those students that produced the most comprehensive reports were later interviewed and from this group 10 who showed a genuine curiosity, interest, and aptitude were selected to become staff members of the laboratory.

The students were then encouraged to familiarize themselves with the oceanographic literature. They discussed their findings at a meeting where it was generally held that while there were a great many excellent problems to work on, many were impractical from the standpoint of available equipment, time, and the difficulty of securing adequate samples. It was decided to begin the studies with readily available fish which not only provided interesting problems but also the opportunity to secure valuable scientific data.

The investigations currently in progress are concerned with the food habits, fecundity, growth, and distribution of some marine fishes of the Atlantic Coast. One of the studies includes the tagging of the commercially-important cod, Gadus callarinas, in an effort to determine the distribution pattern. A 16-foot 18-horsepower motorboat is used for tagging along the coast.

Another project is concerned with determining the distribution patterns of the haddock, Melanogrammus aeglefinis, by attempting to use the infestation pattern



Fig. 3 - Everett Schaner removing the ovaries of a ripe female tomcod. Later he will determine the total number of eggs contained by this individual as part of his fecundity study.

of attached parasites as natural tags. Students are also working on other problems. The food habits of the winter flounder, Pseudopleuronectes americanus, the tomcod, Microgadus tomcod, and the Atlantic cod, Gadus callarias, are under investigation by individual students. While some fish are collected by handlining from the laboratory's 16-foot boat, others are obtained from cooperative fishermen in the local ports of Boston, Cohasset, Scituate, and Hull. Much of the field work is done outside regular school hours.

Fecundity studies requiring careful dissection and measurement of the gonads of the tomcod are in progress. Students are carefully examining, weighing, and classifying the stomach contents of this fish as part of another project. Still another group is concerned with determining the rate of growth of the tomcod. They are studying the various hard bony parts and have found that close examination of the otolith bones, which are found in the skull, reveal the presence of annual rings, similar to the growth pattern found in a cross-section of some north temperate trees, which they feel will be useful in age determination of this fish.



Fig. 4 - Fred Hubble (left to right) and Robert Merritt examine samples of plankton taken from surface tows off the coast of Hull Bay, Mass. George Fahey is busy checking the feeding habits of the tomcod for possible correlation with the plankton productivity investigation.

Plankton tows are taken when possible for use in productivity studies of the local coastal area and also for possible correlation with food habits of the fishes under investigation. Samples of sea water are analyzed at the laboratory periodically for phytoplankton, dissolved oxygen, and salinity determination.

Bibliographic work is done by a special library staff of the laboratory which secures the necessary reference books for the various student project leaders.

The students plan to visit the Oceanographic Institutes at Woods Hole, Mass., in the near future. There they will discuss their own work with scientists actively engaged in similar projects for the Hydrographic Office of the Navy and the U. S. Fish and Wildlife Service.

Through these studies, participating students gain a more comprehensive understanding of scientific methods and principles. There are also good indications that a number of these talented students could conceivably contribute in some small way to a better understanding of basic biological principles.



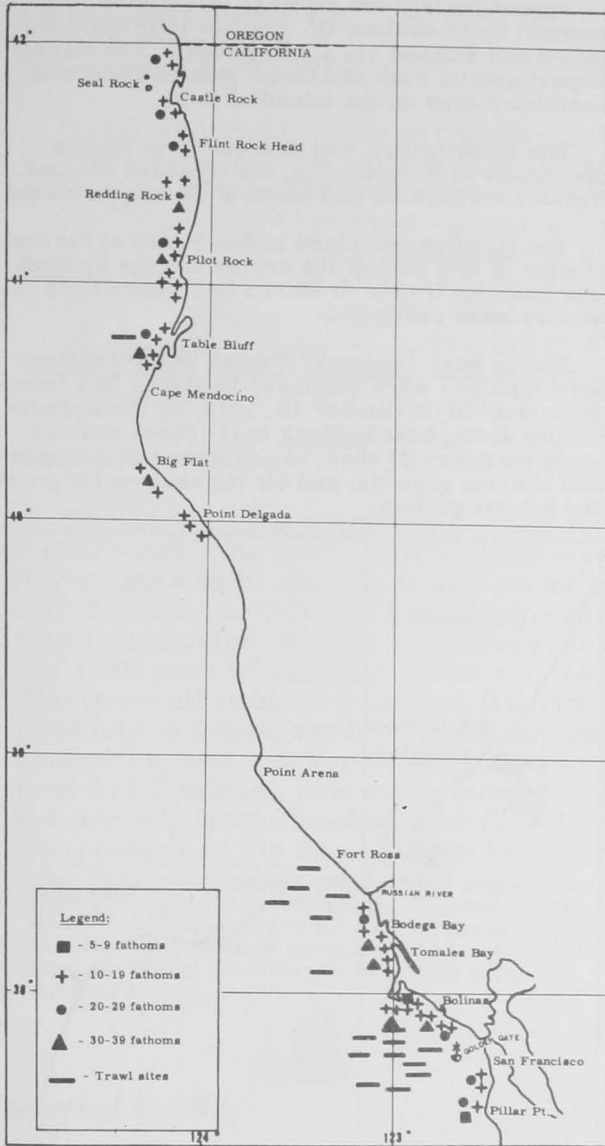
## California

### CRAB DISTRIBUTION AND ABUNDANCE STUDIES CONTINUED:

M/V "N. B. Scofield" Cruise 59S7-Crab: The California coastal waters from San Francisco to Oregon were surveyed (October 15-November 23, 1959) by the California Department of Fish and Game's research vessel N. B. Scofield to determine the distribution, abundance, composition and condition of market or Dungeness crabs within traditional fishing grounds. Other objectives were to conduct exploratory crab fishing in areas lightly exploited by the fishing fleet and to determine the comparative meat yield of hard and soft crabs.

Fifty-two traps of uniform sizes, without escape ports but in every other respect--including baits--comparable to those of the commercial fishery, were employed in depths of 7 to 35 fathoms in 60 separate settings of 16 to 18 traps each. Otter boards and mudlines were utilized on trawling nets of 3½- and 5-inch mesh in 17 exploratory locations at depths of 28 to 120 fathoms. Crabs were captured at each of the 60 trap string locations.

Crabs were taken in 16 of the 17 exploratory trawls. While net sizes, cable meter tests, and technical difficulties affected certain catches, distributional data indicated legal crabs were in depths of 28 to 120 fathoms.



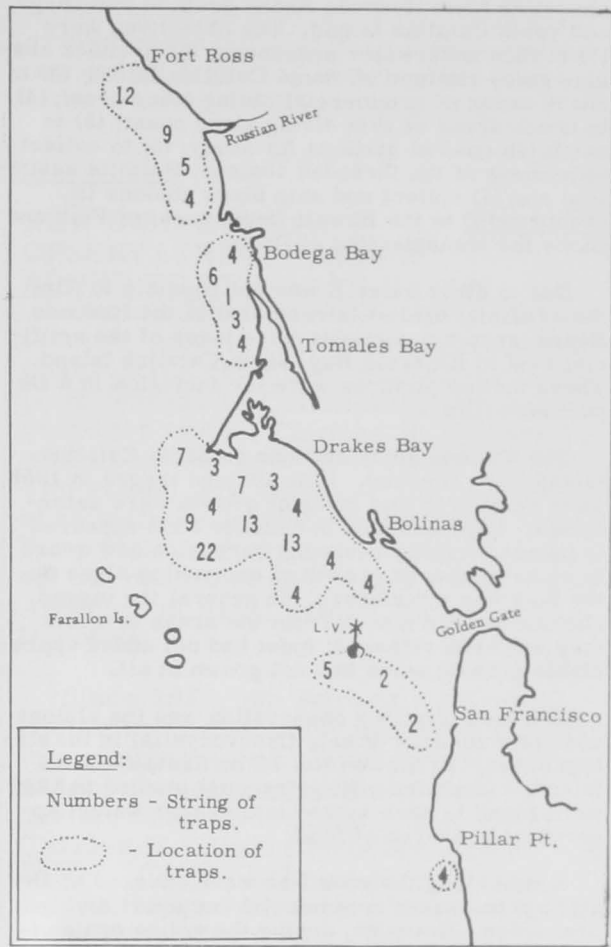
M/V N. B. Scofield Cruise 59S7-Crab (Oct. 14-Nov. 25) 1959).

Soft crabs were increasingly abundant to the northward.

Experiments designed to determine the comparative meat yields of hard and soft crabs showed that soft crabs yield 30 per cent less cooked meat than hard crabs of the same live weight and size.

A Nansen bottle, reversing thermometer, and bathythermograph were utilized to gather oceanographic and environmental data relevant to the crab fishery.

Airplane Spotting Flight 59-22-Crab: The California coastal waters from Half Moon Bay to Point Arena were surveyed from the air on December 3, 1959, by the Department's Cessna 182 to determine the



Flight report Cessna 182, 59-22-Crab (Dec. 3, 1959).

fishing locations and relative densities of the central California crab fleet.

While conditions for aerial observation were generally good, rising swells and an increasing sun angle diminished visibility from Bolinas Point southward.

In all, 158 strings of traps were counted. The most intensive concentrations occurred from Point Reyes to Bolinas Bay. A majority of the settings were well offshore, many in depths of 30-35 fathoms.

Note: Also see Commercial Fisheries Review, February 1959, p. 13, March 1959, p. 31, and July 1959, p. 25.

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**INVESTIGATION OF ABALONE RESOURCES CONTINUED:**

M/V "Nautilus" and Diving Boat "Mollusk" Cruise 59N4-Abalone: The abalone investigations were continued from September 9-October 25, 1959, by the California Fish and Game Department's research vessel Nautilus and diving boat Mollusk in waters off the southern California

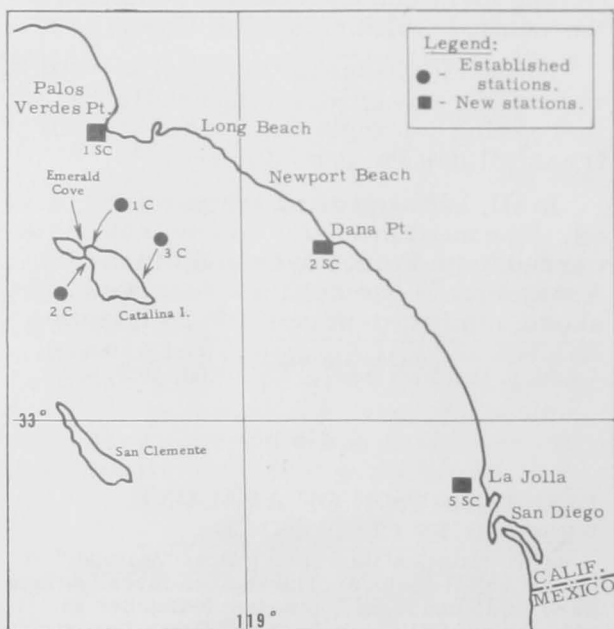
shoreline from Redondo Beach south to San Diego, and Santa Catalina Island. The objectives were (1) to film underwater sequences; (2) to check abalone study stations off Santa Catalina Island; (3) to check areas of commercial diving along coast; (4) to check areas of skin diving along coast; (5) to establish coastal stations for study; (6) to collect specimens of the threaded abalone, *Haliotis assimilis*; and (7) collect and ship black abalone (*H. cracherodii*) to the Hawaii Department of Fish and Game for transplanting at Oahu.

Due to dirty water it was not possible to film the artificial habitat (streetcars) in the Redondo Beach area but pictures were taken of the artificial reef at Emerald Bay, Santa Catalina Island. These motion pictures were for inclusion in a Department film.

The abalone study stations on Santa Catalina Island were checked. Pink abalone tagged in 1958 were recovered and rates of growth were determined. Tags attached in October 1958 appeared to be successfully resisting corrosion and wear. In some instances growth of encrusting algae on the tags was quite heavy. In general the tagged abalone had not moved from the areas in which they had been released; most had not added appreciable growth; some had not grown at all.

The most striking observation was the almost complete absence of kelp (*Macrocystis*) in the station areas. At Station No. 1C on Santa Catalina Island, red abalone (*H. rufescens*) planted in 1956 were found to have moved into deeper water, apparently in search of food.

Areas along the coastline were checked in an attempt to assess commercial and sport diving pressures. However, during the entire cruise water conditions were unfavorable for diving and observations were limited. Stations were established as indicated on the accompanying map.



Abalone Cruise 59N4 and 59M3 (Sept. 9-Oct. 25, 1959).

Approximately 400 small ( $\frac{1}{4}$  to 3 inches in diameter) black abalone (*H. cracherodii*) were collected and shipped via air to Hawaii. The Hawaii Department of Fish and Game planted them in a restricted area on the island of Oahu.

The investigation was successful in finding specimens of *H. assimilis*, the threaded abalone. These were located just north of Portuguese Bend.

The *Nautilus* remained at San Pedro at the conclusion of this part of the cruise and the *Mollusk* was taken by trailer to Morro Bay where field studies were continued.

Diving Boat "Mollusk" Cruise 59M3-Abalone: Investigations were continued in Morro Bay from November 10-December 10, 1959, by the Department's diving boat *Mollusk* to (1) check abalone study stations; (2) observe conditions on commercial abalone grounds; and (3) tag abalone for growth and habitat studies.



Abalone Cruise (M/V *Mollusk* only) (Nov. 10-Dec. 10, 1959).

Rough weather limited diving activities to 3 days during this one-month cruise period. Observations revealed a large number of 8-inch abalone in this area and almost all (between 400-500) showed new shell growth. This growth occurred since August 1959 when previous dives were made. *Nereocystis* has returned and is abundant. It extends over a greater area than in the years before its disappearance.

Note: Also see *Commercial Fisheries Review*, December 1959 p. 40.



## Cans--Shipments for Fishery Products, 1959

Total shipments of metal cans for fishery products in 1959 amounted to 115,453 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 123,602 tons in 1958, a decline of 6 percent. Shipments of metal cans in 1957 amounted to 114,560 tons and in 1956 totaled 112,532 tons.



The drop in the shipment of cans for fishery products from 1958 to 1959 was due primarily to sharply lower packs of Pacific salmon, California and Maine sardines, anchovies, and shrimp. However, the 1959 pack of tuna set a new record. The over-all pack of principal fishery products (salmon, sardines, tuna, shrimp, anchovies, and mackerel) amounted to about 514.2 million pounds, lower by about 6.2 percent from the 1958 pack (548.4 million pounds) of the same products.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



## Central Pacific Fisheries Investigations

### HAWAII'S SKIPJACK TUNA LANDINGS HIGHER IN JANUARY 1960:

Preliminary figures on Hawaii's landings of skipjack tuna of 144,000 pounds in January 1960 indicate an increase of 40,000 pounds as compared with January 1959. Data are supplied to the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu by the tuna packing industry and the Hawaiian Division of Fish and Game.

Length measurements made on the fish as they are landed at the cannery showed the catches were composed of 4- to 20-pound skipjack with modes at 6, 9, and 20 pounds. Although the sample was small (226 fish), the presence of the 20-pound mode during a mid-winter

month is somewhat unusual. The fishermen reported that there were numerous small schools, and that the fish were often wild and difficult to catch.

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### NEW UNDERWATER OBSERVATION CHAMBER ADDED TO RESEARCH VESSEL:

During January 1960 a new bow extension, incorporating an underwater observation chamber, was added to the U. S. Bureau of Commercial Fisheries' research vessel Charles H. Gilbert while she was in a West Coast Shipyard. The vessel now equipped for underwater observations from both the stern and the bow, will conduct tuna behavior studies off the coasts of California and Central America in April before returning to Honolulu.

Since 1957, the Bureau's Honolulu Biological Laboratory has been developing equipment and techniques for direct underwater observations of tuna behavior. The first installation aboard the Charles H. Gilbert involved a diver with an aqua lung positioned on an overside ladder. Improvements in the underwater observation techniques led finally to a chamber within the hull of the vessel. By means of visual observations, supplemented with movie and still camera records, studies were made during actual fishing operations, both standard and under various experimental situations.



## Conservation

### FISH AND WILDLIFE'S ROLE IN NATION'S ECONOMY DISCUSSED AT MEETING:

The role of fish and wildlife in our present economy was explored on January 14, 1960, in a meeting between the Secretary of the Interior and representatives of oil companies and conservation associations. This is the second such meeting, the first having been held about a year and a half ago.

After a welcome by the Secretary, the discussions were launched by a series of remarks by oil company officials, each

explaining what his company was doing in the field of fish and wildlife conservation.

These explanations were followed by discussion of such subjects as the need for future study, planning, and methods of expediting the exchange of information between the companies and the conservation groups.



### Federal Purchases of Fishery Products

#### DEPARTMENT OF DEFENSE PURCHASES, 1955-59:

**Fresh and Frozen Fishery Products:** During the calendar year 1959 purchases of fresh and frozen fishery products by the Department of Defense for the use of the Armed Forces amounted to 22.7 million pounds, valued at \$11.6 million. This amount was slightly higher (0.6 percent) in quantity, but was lower by 9.5 percent in value as compared with the preceding year. Prices paid for fresh and frozen fishery products in 1959 by the Department of Defense averaged 51.3 cents a pound, lower by 5.8 cents a pound from the 1958 average of 57.1 cents. This was due mainly to lower market prices for most fishery products in 1959. For the five-year period 1955-59, purchases varied between a high of 26.6 million pounds in 1956 to a low of 22.5 million pounds in 1958. Prices paid per pound jumped sharply from the over-all average of 43.7 cents a pound paid in 1955 to the peak price paid in 1958.

**Canned Fishery Products:** Purchases of canned fishery products in 1959 were down sharply from the preceding year. Purchases of canned tuna (3.7 million pounds) were down 37.2 percent from the 5.9 million pounds purchased in 1958, canned salmon purchases dropped 67.5 percent, or from 3.3 million pounds in 1958 to 1.1 million pounds in 1959. However, purchases of canned sardines in 1959 of about 1.1 million pounds were up 315 percent from the preceding year and close to seven times the purchases made in 1955. Canned salmon purchases made in 1959 were the lowest in five years, but the pack was the lowest in history. Canned tuna purchases, although down from 1958, were the second highest purchases made in the period 1955-59.

#### DEPARTMENT OF DEFENSE PURCHASES, JANUARY 1960:

**Fresh and Frozen Fishery Products:** For the use of the Armed Forces under the Department of Defense, 1.5 million pounds (value \$737,000) of fresh and frozen fishery products were purchased in January 1960 by the Military Subsistence Supply Agency. This was lower than the quantity purchased in December 1959 by 15.7 percent, but was 0.5 percent above the amount purchased in January 1958. The value of the purchases in January 1960 was lower by 15.9 percent as compared with December 1959 and 12.7 percent less than for January 1959.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, January 1960 with Comparisons

QUANTITY				VALUE		
January		Jan.-Dec.		January		Jan.-Dec.
1960	1959	1960	1959	1960	1959	1959
(1,000 Lbs.)				(\$1,000)		
1,497	1,489	22,651	737	844	11,624	

Prices paid for fresh and frozen fishery products by the Department of Defense in January 1960 averaged 49.2 cents a pound, about 0.2 cents less than the 49.4 cents paid in December 1959 and 7.5 cents less than the 56.7 cents paid during January 1959. The lower average price for purchases this January as compared with January a year ago was due to a sharp drop in fillet, shrimp, and scallop prices.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, 1955-59

Product	1959		1958		1957		1956		1955	
	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value
	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000
Fresh and Frozen Fishery Products	22,651	11,624	22,511	12,850	23,452	12,080	26,610	13,413	24,989	10,929

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, 1955-59

Product	Quantity				
	1959	1958	1957	1956	1955
	(1,000 Lbs.)				
Tuna	3,698	5,884	2,711	3,334	2,906
Salmon	1,085	3,336	3,111	2,798	2,785
Sardines	1,051	253	215	236	143
Total	5,834	9,473	6,037	6,368	5,834

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**Canned Fishery Products:** Tuna was the only canned fishery product purchased in quantity for the use of the Armed Forces during January this year. Purchases of canned tuna in January 1960 were up about 17 percent from January a year ago. However, the value of the canned tuna purchases this year was only 42.4 cents a pound as compared with 49.7 cents in January 1959. 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.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, January 1960 with Comparisons

Product	QUANTITY				VALUE	
	January		Jan.-Dec.		January	
	1960	1959	1960	1959	1960	1959
	(1,000 Lbs.)				(\$1,000)	
Tuna . . .	451	385	3,698	191	192	1,672
Salmon . .	-	-	1,085	-	-	737
Sardine . .	6	12	1,051	4	4	177



### Inspection of Fishery Products

#### OVER 42 MILLION POUNDS PACKED IN 1959 UNDER GOVERNMENT INSPECTION BY SOUTH ATLANTIC AND GULF STATES FISHERY PLANTS:

Inspection and grading services for fishery products became the responsibility of the U. S. Department of the Interior on July 1, 1958. Inspection and grading services are available on a fee basis to processors who meet the existing voluntary Federal standards of quality for fishery products. A U. S. Bureau of Commercial Fisheries inspection corps has been given specialized training and assigned to the fishery plants throughout the country which requested voluntary continuous inspection of their products. This service provides that an inspector or inspectors be stationed at each plant during all shifts of the processing operation. The inspector (a) checks plant personnel and equipment for sanitation, (b) checks the raw material for wholesomeness, (c) checks the processing of the finished products, and (d) selects finished product samples for grading. When the final inspection of the finished product is made, he will issue certificates attesting to the grade or quality and condition of the lot. He also furnishes plant management with a daily inspection report commenting on the sanitary conditions and the results of the products inspection.

Continuous inspection services assure the processor and purchaser of satisfactory compliance with the requirements for wholesomeness of the raw materials used and of sanitation established for the handling and processing operations.

Twenty-nine plants have applied and are now under continuous inspection. Of this total, 14 are located in the South Atlantic and Gulf States. From July 1, 1958 (when continuous inspection of fishery products was started by the U. S. Department of the Interior) through December 1958, a total of almost 11.4 million pounds of fishery products was packed by 10 plants in the South Atlantic and Gulf States. Of this amount, almost 11.2 million pounds was frozen raw

breaded shrimp. In 1959, 14 plants in those states were packing under continuous inspection and in the 12 months of that year a total of 42.3 million pounds of products was packed. Of that total, 36.2 million pounds was frozen raw breaded shrimp.



### Marketing

#### EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, FIRST QUARTER 1960:

United States civilian per capita consumption of fishery products in 1959 is estimated to have been 10.7 pounds, a little more than a year earlier. The rate for the fresh and frozen products was about the same as in 1958, but there was some increase for the canned items. Current supplies appear adequate to maintain consumption by civilians at about the same rate this winter and early spring as last. A probable gain for the fresh and frozen fishery products is likely to counterbalance a decline for the canned. Retail prices of fishery products averaged somewhat lower than in 1958, when they were record high. Expectations are that prices in the next few months will likely be relatively stable, though averaging lower than a year earlier.

The catch of food fish and shellfish was more than a tenth lower in 1959 than in 1958. The reduction was principally in the species that are canned. Commercial landings were at the low point of the year in the winter and started increasing seasonally in early spring.

Fishery Products Packed in South Atlantic and Gulf States Plants Under U. S. D. I. Inspection

Product	In Pkgs. of Less than 2 Lbs.				In Pkgs. of 2 lbs. & Over				Total Quantity Pkg'd.	
	12 Mos.		July-Dec.		12 Mos.		July-Dec.		12 Mos.	July-Dec.
	No. Plants	Quantity (1,000 Lbs.)	No. Plants	Quantity (1,000 Lbs.)	No. Plants	Quantity (1,000 Lbs.)	No. Plants	Quantity (1,000 Lbs.)	1959	1958
Shrimp, frozen, raw:										
Breaded . . . . .	14	19,655	10	6,017	14	16,504	10	5,137	36,159	2/11,154
Peeled & deveined .	12	1,637	3	99	11	1,066	2	1/	2,703	99
In shell . . . . .	7	535	1	1/	10	1,312	2	1/	1,847	3/
<b>Total . . . . .</b>	<b>14</b>	<b>21,827</b>	<b>10</b>	<b>6,116</b>	<b>14</b>	<b>18,882</b>	<b>10</b>	<b>5,137</b>	<b>40,709</b>	<b>11,253</b>
Other products <sup>1/</sup> . . . . .									1,631	108
<b>Grand total . . . . .</b>									<b>42,340</b>	<b>11,361</b>

1/ Packed by less than 3 plants and included with "breaded."  
 2/ Includes small quantity of "peeled & deveined" and "in shell" products packed by less than 3 plants.  
 3/ Included with "breaded" because packed by less than 3 plants.  
 4/ Includes specialty shrimp products, crab meat, crab meat stocks, devilled crabs, crab patties, lobster cutlets, lobster steaks, lobster tails, breaded oysters, breaded scallops, catfish, flounder, breaded fish fillets, raw and cooked fish sticks, red snapper tenderloin, snapper fingers, swordfish, and breaded trout fillets.  
 Note: Plants covered in 1959 were located: 2 in Ga., 5 in Fla., 1 in La., and 6 in Tex.



Production of canned fishery products was around 20 percent lower last year than in 1958. Tuna and mackerel were the only major canned products for which output was higher in 1959. The pack of salmon was a third less than in 1958 and the smallest since 1898. Production of canned salmon has been on the downtrend, particularly in the past decade, because of the scarcity of fish. About a sixth fewer Maine sardines and two-thirds fewer California pilchards were packed last year. Per capita consumption of canned fishery products was maintained at a somewhat higher rate in 1959 than in 1958 by moderately larger imports and by drawing on the large stocks which were on hand at the beginning of 1959. Accordingly, supplies of the canned products available for distribution in the next several months are noticeably lower than a year earlier.

The stocks of frozen edible fishery products were larger this February 1 than last. Stocks represent the primary source of frozen fish and shellfish supplies until the seasonal pickup in the commercial catch in early spring.

Imports of fishery products were moderately larger in 1959 than in 1958. Increases occurred both for the fresh and frozen and the canned products. Exports were up substantially from 1958 because of the sharply increased movement abroad of the canned products--particularly of California pilchards, salmon, and squid. Prospects for the next several months are that imports of fishery products will continue at a high rate, but exports will likely be substantially lower than in the winter and spring of 1959.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the former agency's February 25, 1960, release of The National Food Situation (NFS-91).

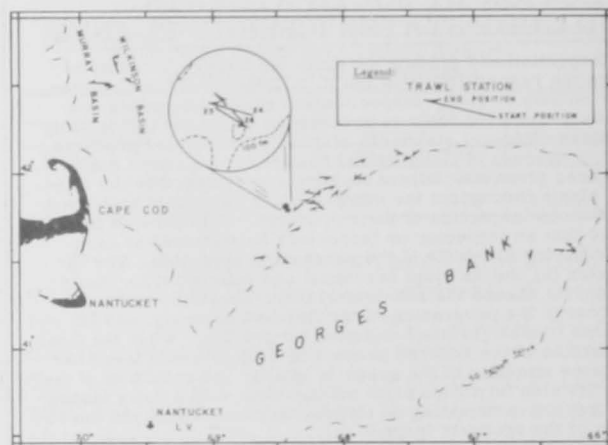


## North Atlantic Fisheries Exploration and Gear Research

### WINTER DISTRIBUTION OF WHITING STUDIED:

M/V "Delaware" Cruise 60-1: To investigate the winter distribution of whiting in deep water was the objective of a January 1960 cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. The cruise was divided into two phases.

**PHASE I:** Although bad weather hampered fishing operations, 31 successful tows were made in depths ranging from



M/V Delaware Cruise 60-1, Phase I (January 5-15, 1960).

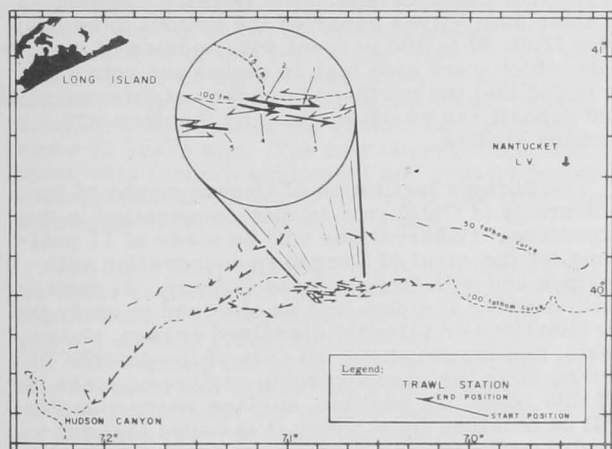
40 to 154 fathoms in selected areas lying near or along the edge of the northern and eastern parts of Georges Bank and in Wilkinson and Murray Basins. In spite of efforts to choose appropriate areas for trawling, three tows resulted in some damage to the net.

Of the better catches was an estimated 2,500 pounds total catch for the No. 36 trawl with liner at trawl station No. 24, with 5,000 and 7,000 pounds for two subsequent tows with the large whiting net in the same area at trawl stations Nos. 25 and 26. These catches consisted of an estimated 2,000, 4,000, and 5,000 pounds of whiting, respectively, with hake (*Urophycis chuss*) making up most of the remainder of the catches. The total catch from the three stations included less than 500 pounds of other fish. These and other tows used the same type of equipment as described above, and were of 45-minute duration.

All of the whiting were M. bilinearis; no M. albidus were taken.

In cooperation with the Woods Hole Oceanographic Institution's study of surface currents, 288 drift bottles were released at 48 locations, and a number of bathythermograph casts were made during both phases of this cruise.

PHASE II: The Delaware found commercial concentrations of whiting (M. bilinearis and M. albidus) in an area extending from lat.  $40^{\circ}03' N.$ , long.  $70^{\circ}15' 30'' W.$  to lat.  $39^{\circ}33' N.$ , long.  $72^{\circ}08' W.$ , at a depth of 100 fathoms. In five of the 1-hour exploratory tows, a catch of 15 tons of marketable-size whiting was obtained. The species composition of these commercial tows was predominantly of the common commercial whiting.



M/V Delaware Cruise 60-1, Phase II (January 19-30, 1960).

In the best fishing area, there was a relatively small amount of hake (Urophycis chuss) mixed in with the whiting. Two night tows were made in the area: one tow in the 100-fathom depth had a yield of 5,000 pounds; the other in a 175-fathom depth had 1,000 pounds. Other sections of the area surveyed produced whiting and hake in lesser amounts. A total of 44 tows were made.

During night fishing, nylon gill nets, fished vertically from the surface to a depth of 15 fathoms, were used. Results showed that it is possible to use this method for attempts to sample mid-depth zones; however, fish were not caught during these experimental tests.

Echo-sounder observations indicated considerable quantities of fish near the bottom but none at midwater trawling depth; therefore, midwater trawling was not attempted.

Approximately 1,300 whiting (M. albidus) were preserved by freezing and were turned over to the Woods Hole Biological Laboratory for detailed study. Other preserved specimens included several tilefish (Lopholatilus chamaeleonticeps) of various sizes.

GEAR AND METHODS: A No. 36 trawl (60' head rope, 80' foot rope,  $\frac{1}{2}''$  small mesh liner) was used as a try-net. When favorable signs of whiting resulted from tows made with this net, a large commercial whiting trawl (76' head rope, 96' foot rope, 2" mesh,  $1\frac{1}{2}''$  cod end) was towed in the same area. By this method of operation, it was possible to avoid incurring excessive damage to the large whiting trawl during exploratory tows and to compare the fishing effectiveness of the two nets.

NEXT TRIP: The M/V Delaware left Gloucester, Mass., February 11, 1960, for Cruise 60-2. The cruise was to be divided into three phases. The first and third phases were to be conducted under the direction of the Bureau's Biological Laboratory, Woods Hole, Mass., and consist of hydrographic and trawling transects along the coast from Cape Hatteras to Martha's Vineyard.

During the second phase, Exploratory Fishing and Gear Research was to conduct deep-water trawling to extend the area of exploration for red crabs (Gerres quinque-dens) and other deep-water species of fish and shellfish, investigated during M/V Delaware Cruise 59-7 off the Middle Atlantic area.

The vessel was scheduled to make port in Norfolk, Va., after the first phase and to return to Gloucester on or about February 29, 1960.



## North Atlantic Fisheries Investigations

### CONTRACT LET FOR DESIGN OF NEW FISHERY RESEARCH VESSEL TO REPLACE "ALBATROSS III:"

The U. S. Bureau of Commercial Fisheries has selected a firm of Boston naval architects to provide architectural services for the design and construction of a new fishery research vessel to replace the Albatross III. The Albatross III was deactivated in March 1959, because of excessive costs of repair and maintenance. Included in fiscal year 1961 Federal Budget is an item of \$2,055,000, earmarked for the Bureau's new research vessel.

The Bureau's plans call for a vessel 175-180 feet over-all length with a beam of 33 feet, developing 1,600-1,800 hp. and a speed of about 14 knots. Equipment will include laboratories and other facilities necessary to carry out the research and survey work required of the new vessel. The vessel will conduct fishery research in the Northwest Atlantic, with the major emphasis on groundfish species.

It is expected that plans and specifications will be completed in time to award contracts for construction late in 1960.



## Oceanography

### NATIONAL OCEANOGRAPHIC EXPEDITION BY COAST AND GEODETIC SURVEY VESSEL:

The survey ship Explorer began an extensive oceanographic expedition en route from Seattle, Wash., by way of the Panama Canal to Norfolk, Va., February 1, 1960, the Director of the Coast and Geodetic Survey, U. S. Department of Commerce, announced recently. This modern oceanographic cruise will be the first full-scale expedition of its kind by the Survey since historic oceanographic surveys were made by the ship Blake, in the early 1880's.

The Explorer will extend her normal transfer time from the West to the East coast by more than two months in order to investigate various oceanographic features along the route. The 220-foot long ship is being reassigned for service along the east coast of the United States and will be replaced in the Alaska survey fleet by the new ship Surveyor which will soon be commissioned at San Diego.

The expedition is being supported in part by a grant from the National Science Foundation and is a cooperative venture with 12 or more organizations participating.

The Fish and Wildlife Service and the Geological Survey of the U. S. Department of the Interior are vitally interested in this expedition. A geological survey of the Swan Islands will be undertaken; and, for the Fish and Wildlife Service, dredgings to recover bottom-dwelling animals will be made in the Caribbean and in the Straits of Florida. Mammals, reptiles, and insects will be collected on the Swan Islands for the U. S. National Museum of the Smithsonian Institution. An attempt will be made to capture live animals on these islands for the National Zoological Park.

Samples of ocean bottom sediments to be tested for radioactivity will be collected for the U. S. Public Health Service for use in its radio chemical surveillance program.

The U. S. Navy Electronics Laboratory at San Diego will have on board a deep-sea camera for photographing the ocean bottom off the West coast of Central America where the Russian oceanographic ship Vityaz reported the bottom to be covered from 80 to 100 percent with nodules of manganese which were also high in nickel and cobalt. It is hoped that the northern boundary of this potential ore deposit can be determined by the deep-sea camera studies.

The Scripps Institution of Oceanography of the University of California is also cooperating in the expedition. Observations will be made at 11 positions off the coast of Oregon in cooperation with Scripps and with Oregon State College. At each station water samples will be obtained to study the distributions of salinity, dissolved oxygen, phosphate, and temperature; all data of importance in determining the oceanographic regime or make up off this coast. In addition, surface water samples will be obtained from which it is hoped that suspended sediment will help oceanographers learn what happens to Columbia River water once it enters the Pacific.

Scripps has provided a magnetometer which will be towed behind the Explorer from San Diego to Norfolk. This instrument will provide a continuous record of the earth's magnetic field along the ship's track. This information, coupled with records of the bottom topography, will add considerably to man's knowledge of the intricate magnetic field of the earth. If the magnetometer discovers unsuspected or unexplained magnetic "hills" or "valleys," the ship's plans are such that extra time can be taken to survey the area in more detail.

Throughout the entire expedition current drift bottles will be dropped at regular intervals with cards enclosed asking the finders to inform the Coast and Geodetic Survey where the bottles have been recovered. It is hoped that these bottles will provide clues to the circulation of the waters along the Pacific Coast of North and Central America, of the western Caribbean, and the Gulf of Mexico, and will add to our knowledge of the mighty Gulf Stream.

The ocean's temperature will be taken at hourly intervals throughout the trip. An instrument will

be lowered which will provide the oceanographers with a profile of temperature versus depth.

Oceanographic observations similar to those off the Oregon coast will be made at regular intervals in the Pacific, the Caribbean, Gulf of Mexico, and along the Atlantic Coast.

The bottom sediments along the route will be studied by means of cores and dredges. The shelf around the United States Swan Islands will be extensively studied. These limestone islands cap a small bank that drops off abruptly to the north to depths of over 3,000 fathoms (18,000 feet) in the Cayman Trough. An objective of these investigations is to attempt to ascertain whether these islands are related to the complex of cays (small islands) and banks off Honduras or if the origin is structural and related to the massive Cayman Trough.

It is hoped that dredging for rock on the steep slopes south of the Florida Keys will provide information on the structure of this interesting area.

Of special interest will be measurements of the speed and direction of the Gulf Stream, not only at the surface but at depths down to about 1,500 feet. Observations of this important "river in the sea" will be made at the same location at which Lieutenant Pillsbury, commanding the Coast Survey Steamer Blake, made his classic observations some 70 years ago. The new observations will be made with modern equipment and greatly improved techniques in contrast to the crude and time-consuming methods of Pillsbury's day.

The hills and valleys of the ocean bottom will be under constant surveillance by means of electronic echo-sounding equipment aboard the Explorer. Divers from the Coast and Geodetic Survey will explore the ocean bottom, the fish, and marine plant life around the Swan Islands, and plan to photograph the various instruments in use as they are lowered from the Explorer.

Oceanographic activities have been carried on by the Coast and Geodetic Survey since its earliest years. This latest effort will be an extension of pioneering work in the development of equipment and techniques for making oceanographic investigations.



## Outdoor Recreation Resources

### Review Commission

#### COMMISSION MEETS WITH ADVISORY COUNCIL:

In concluding the two-day meeting in January 1960 of the Outdoor Recreation Resources Review Commission with its Advisory Council, Chairman Laurance S. Rockefeller said that the Commission is well on its way to completing the job assigned to it by the Eighty-Fifth Congress.

The meeting was called by the Chairman to gather the advice of the Advisory Council in assisting the Commission to become aware of and evaluate the various problems of meeting present recreational needs facing the nation on a Federal, state, and community basis, and anticipating those needs for the years 1976 and 2000.

The meeting in Washington brought together the eight Congressional Commissioners and seven Presidential appointees of the Commission, with the 25 citizens and 14 Federal liaison officers who make up the Advisory Council.

Charles E. Jackson of the National Fisheries Institute is the Commercial Fisheries representative on the Advisory Council. Jackson said, "It is inevitable that commercial fishing rights will be involved in long-range recreational planning. I am impressed with the broad-minded views of the Commission and Council on the necessity of solving conflicts of interests and the need to consider all economic uses of natural resources like fisheries and forestry."



## Salmon

### KING SALMON RUN OF CENTRAL CALIFORNIA RIVERS LARGEST SINCE 1954:

The largest king salmon spawning run since 1954 in the central California valleys has been recorded in 1959/60 by the California Department of Fish and Game. The Director said some 480,000 salmon spawned in the Sacramento-San Joaquin River system, the most important king salmon spawning area on the West Coast. In 1954, the number was 482,000.

The 1959/60 mark is well ahead of the previous year's 290,000 king salmon spawners and approaches the 500,000 which the Department has said is the number needed to maintain the commercial and sports fisheries at a high level. Previous high in this decade was attained in 1953 when 597,000 spawners were estimated.

The 1959/60 spawners are progeny of those fish which spawned in the 1955/56 winter--the time of the big flood.

While the count this year is the best in five years, the Director said some losses clouded an otherwise bright picture. Most important of these occurred in the Yuba River where the production of some 3,500 salmon, of a very excellent run of 10,000, was lost below Daguette Point Dam because of water manipulation which resulted in the stranding of salmon nests and ripe salmon.



## Shad

### CHESAPEAKE BAY SHAD RUN DELAYED BY COLD WATER:

Late in February 1960, Virginia fishermen were waiting impatiently for the 1960 run of shad in the lower part of Chesapeake Bay. But Virginia Fisheries Laboratory scientists pointed out that the seasonal shad run to the rivers would not take place until water temperatures reached about 45° F. A cold February has kept river temperatures 5° F. too low and few shad had appeared as of the end of that month.

Studies made earlier by Virginia fisheries biologists showed that the greatest catches in the York River system have been when water temperatures ranged between 45° and 59° F. Almost no shad have been caught in the York River at water temperatures below 40° F.

In cooperation with the Virginia Fisheries Laboratory, the U. S. Bureau of Commercial Fisheries will again collect catch records on the York River and its tributaries. Fishermen have already been sent log books in which to record their catches and the Bureau biologists will be on the River about mid-March in order to interview shad fishermen and tag fish.

From last year's tagging program, the scientists were able to estimate that 310,000 shad entered the River to spawn and about half of these were caught by the fishermen.

Previous studies done by the Bureau and Virginia biologists has led to the conclusion that overfishing has not been a serious problem in the York River system during the past 20 years and that further protective legislation is not warranted at this time. Thus, shad fishermen have been able to legally catch as many fish as they could use or sell.

Last year's records indicate that the average weight per buck or male shad was 2.3 pounds and for female or roe shad, 3.2 pounds. In 1959, pound nets took about 3 percent of the total catch; fyke nets, 2 percent; haul seines, less than 1 percent; stake gill nets, 48 percent; and drift gill nets 46 percent of the catch. The age of the shad, as determined from scale samples, showed that the catch was predominantly 3- and 4-year old buck shad and 5-year old roe shad. The oldest fish sampled was 7 years old.

Fishermen have been requested to keep careful records of their catches and to return all tags recovered from fishes as soon as possible. A fishery research biologist from Bureau's Beaufort Laboratory, reports that about 300 shad were tagged on the spawning grounds in 1959 in an attempt to determine if York River shad return to the same stream to spawn in successive years. Fishermen were requested to keep a special look-out for these tags to enable the biologists to complete this phase of their work.



## Shrimp

### COMPREHENSIVE ECONOMIC STUDY BEGINS:

A comprehensive economic study of domestic shrimp industry production has been inaugurated by the U. S. Bureau of Commercial Fisheries. The study will deal with an intensive analysis of competitive conditions in the industry. A declining trend in catch per vessel and increased foreign competition were noted in an earlier study.<sup>1/</sup> These trends will be studied in more detail.

<sup>1/</sup> Published as Special Scientific Report-Fisheries Nos. 277 and 308, Survey of the United States Shrimp Industry.

The objectives of the long-range study are to determine the position of the domestic shrimp industry in relation to foreign-based shrimp industries; to examine economic trends in the domestic shrimp industry; to analyze special problems retarding productivity; to recommend measures to solve or mitigate such problems.

The first phase of this study will be done by the University of Florida under a contract from the Bureau. The objectives of this phase are to assess the efficiency of vessel and boat operations in the principal shrimp fisheries of the South Atlantic States and the Gulf of Mexico area; and to appraise each fishery as a potential source of supply, bearing in mind the factor mentioned above and port facilities, labor available, navigational hazards, shore facilities for processing, refrigeration, and transport. This phase of the study will be conducted in the shrimp fisheries in North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas.

Information already available in the files of the Bureau of Commercial Fisheries, data from Federal Trade Commission studies, and from vessel documentations at the Bureau of Customs will be available for the study.

The reason for the study is the economic distress in which the shrimp industry now finds itself, despite the fact that it holds first place in dollar value of all United States fishery products. During World War II and the early post-war years, the domestic shrimp industry prospered. The shrimp catch, which was 143 million pounds in 1938, jumped to 200 million pounds by 1951. Since then it has consistently held to more than 200 million pounds but at no time has it reached the 1954 peak of 268 million pounds.

Improved processing and better markets led to an expansion of demand and, in turn, location of some new fishing grounds, a sharp increase in the number of fishing vessels, and improvements in both equipment and methods of fishing. Even with more vessels at work, there has been a decline in total landings since

1954. This decline in average rate of catch per vessel has resulted in an increase in unit costs of production.

The contract with the University of Florida is financed with funds made available by the Saltonstall-Kennedy Act of 1954. Under the contract terms not more than \$16,400 will be spent on Phase I of the study. This phase is to be completed by December 15, 1960.



## Standards

### HEARINGS ON PROPOSED STANDARDS FOR FROZEN RAW HEADLESS SHRIMP:

Five open meetings were scheduled in March for hearings on the proposed United States Standards for Grade for Frozen Raw Headless Shrimp. The meetings were held in Jacksonville, Fla., New Orleans, La., Corpus Christi, Tex., Los Angeles, Calif., and Chicago, Ill., and conducted by technologists of the U. S. Bureau of Commercial Fisheries. An invitation to attend the hearings was extended to packers, brokers, distributors, users, and others interested in the grade standards for frozen raw headless shrimp.



## Tagging

### RADIOACTIVE FISH TAG USE LICENSED BY ATOMIC ENERGY COMMISSION:

On February 16, 1960, the Atomic Energy Commission issued a license to the U. S. Bureau of Commercial Fisheries for the use of a new low-level radioactive fish tag to be used in Southeastern Alaska herring migration studies. The new tag, like the old type, is inserted in the body cavity of the herring, but being radioactive, is much more speedily and accurately recovered by special detectors at the processing plant. Thousands of herring will eventually be tagged, released, and then caught again at a later date by fishermen who deliver them to the processing plant. Fish tagged with the radioactive "belly insert tag" are

immediately detected at the plant, re-covered, measured, and aged. In this way the strength of year-classes or populations, and the migrations of these fishes may be determined for management purposes. It is not known at present when the tagging program will get under way.

It is unlikely that the public would ever come into contact with the new tag because of many precautionary measures. Even so, the tags are of such low-level radioactivity that no hazard exists.



## United States Fishing

### Fleet <sup>1/</sup> Additions

#### JANUARY 1960:

A total of 16 vessels of 5 net tons and over was issued first documents as fishing craft during January 1960--a decrease

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, January 1960

Area	January		Total 1959
	1960	1959	
	. . . . .(Number). . . . .		
New England . . . . .	1	2	15
Middle Atlantic . . . . .	1	-	12
Chesapeake . . . . .	5	9	106
South Atlantic . . . . .	3	8	76
Gulf . . . . .	4	6	135
Pacific . . . . .	2	3	97
Great Lakes . . . . .	-	1	6
Alaska . . . . .	-	-	32
<b>Total</b>	<b>16</b>	<b>29</b>	<b>479</b>

Note: Vessels have been assigned to the various areas on the basis of their home ports.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, January 1960

Net Tons	Number
5 to 9 . . . . .	7
10 to 19 . . . . .	3
30 to 39 . . . . .	3
40 to 49 . . . . .	3
<b>Total</b> . . . . .	<b>16</b>

of 13 vessels compared with the same month in 1959. The Chesapeake area led with 5 vessels, followed by the Gulf with 4, and the South Atlantic with 3. The Pacific, the New England, and the Middle Atlantic areas accounted for the remaining 4 vessels.

<sup>1/</sup> Includes both commercial and sport fishing craft.



## U. S. Foreign Trade

### EDIBLE FISHERY PRODUCTS, DECEMBER 1959:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during December 1959 increased 12.5 percent in quantity and 6.4 percent in value as compared with November 1959. The increase was due primarily to higher imports of groundfish fillets and blocks (up 2.4 million pounds), frozen albacore and other tuna (up 9.8 million pounds), and to a lesser degree, an increase in the imports of Canadian lobsters and fillets other than groundfish. The increase was partly offset by a 3.4-million-pound decrease in the imports of canned tuna in brine, fresh and frozen salmon (down 3.4 million pounds), and canned salmon (down 1.6 million pounds).

United States Foreign Trade in Edible Fishery Products, December 1958 with Comparisons					
Item	Quantity			Value	
	December 1959	1958	Year 1958	December 1959	Year 1958
<b>Imports:</b>	(Millions of Lbs.)			(Millions of \$).	
Fish & shellfish: Fresh, frozen, & processed <sup>1/</sup> . . . . .	97.8	78.9	956.8	28.2	23.4 278.4
<b>Exports:</b>					
Fish & shellfish: Processed <sup>1/</sup> only (excluding fresh & frozen . . . . .	5.5	4.4	41.2	1.5	1.2 15.6

<sup>1/</sup> Includes pastes, sauces, clam chowder, and juice, and other specialties.

Compared with December 1958, the imports in December 1959 were up 24.0 percent in quantity and 20.5 percent in value due to higher imports of frozen albacore tuna (up 7.1 million pounds), groundfish fillets and blocks (up 7.8 million pounds), and canned tuna in brine (up 3.6 million pounds). Compensating, in part, for the increases was a drop of about 3.5 million pounds in the imports of frozen tuna other than albacore, fresh and frozen salmon (down 1.1 million pounds), and canned salmon (down 1.0 million pounds).

United States exports of processed fish and shellfish in December 1959 were lower by 43.0 percent in quantity and 66.7 percent in value as compared with November 1959.

\* \* \* \* \*

**IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:**

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1960 at the 12½-percent rate of duty had not been determined as of March 14, 1960. The quota for 1959 was 52,372,574 pounds. Any imports in excess of the quota are dutiable at 25 percent ad valorem.

Imports from January 1-February 27, 1960, amounted to 5,168,179 pounds, according to data compiled by the Bureau of Customs.



**Wholesale Prices, February 1960**

**WHOLESALE PRICES, FEBRUARY 1960:**

In February this year wholesale prices for edible fishery products (fresh, frozen, and canned) at 121.8 percent of the 1947-49 average were about unchanged from the preceding month. Increases in wholesale fresh and frozen shrimp prices were just about offset by lower prices for drawn and filleted haddock. From February a year ago to this February over-all wholesale fishery products prices were down by 8.9 percent due to lower prices for a majority of the items that make up the index, particularly haddock and shrimp.

The weaker market for haddock at Boston, which has been evident during past few months, continued into February this year. Landings of both large and small haddock through February this year were lower than in the same period a year ago, but the sharply higher inventories of frozen haddock fillets and other fillets continued to depress the market for fresh fish at New England ports. The drawn, dressed, and whole finfish subgroup index declined one percent from January to February this year due to a 5.1-percent drop in the price for large drawn haddock and a drop of about one cent a pound for frozen dressed halibut. These declines were just about offset by increases in wholesale prices for frozen king salmon, round whitefish, and yellow pike. Compared with February a year ago, the subgroup index was down by 14.9 percent due to lower wholesale prices for all the items that make up the group. The sharpest price declines occurred in drawn haddock (down 43.2 percent) and in dressed halibut (down 12.0 percent).

**Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, February 1960 With Comparisons**

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1947-49=100)			
			Feb. 1960	Jan. 1960	Feb. 1960	Jan. 1960	Dec. 1959	Feb. 1959
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					121.8	121.9	122.7	133.7
<b>Fresh &amp; Frozen Fishery Products:</b>					134.9	135.1	136.4	157.9
<b>Drawn, Dressed, or Whole Finfish:</b>					147.2	148.7	154.8	170.9
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.12	.13	120.9	127.4	163.9	212.8
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.29	.30	90.3	93.8	96.4	102.6
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.77	.77	172.5	171.9	171.3	173.0
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.75	.65	185.9	159.9	115.3	190.9
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.68	.80	136.6	161.9	177.0	161.8
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.73	.71	170.0	166.5	138.4	173.5
<b>Processed, Fresh (Fish &amp; Shellfish):</b>					134.5	135.8	134.6	151.1
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.41	.44	139.5	148.0	166.7	205.9
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.71	.68	112.2	106.6	101.9	145.3
Oysters, shucked, standards	Norfolk	gal.	6.63	7.00	163.9	173.2	173.2	148.5
<b>Processed, Frozen, (Fish &amp; Shellfish):</b>					110.2	107.9	106.8	137.4
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.38	.38	98.1	98.1	98.1	108.6
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.31	.31	97.3	97.3	97.3	131.8
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.27	110.8	108.8	108.8	124.9
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.68	.65	104.1	100.3	98.4	133.8
<b>Canned Fishery Products:</b>					103.8	103.8	103.8	98.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.50	24.50	127.8	127.8	127.8	116.1
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	10.80	10.80	77.9	77.9	77.9	79.3
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	8.00	8.00	93.9	93.9	93.9	86.6
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.75	8.75	93.1	93.1	93.1	87.5

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.



Fresh processed fish and shellfish wholesale prices in February 1960 were down 0.6 percent from the preceding month. An increase of 5.3 percent in fresh shrimp prices at New York City was more than offset by a drop of 5.7 percent in fresh haddock fillet prices and a 5.4-percent drop in fresh shucked oyster prices. A decline of 11.0 percent occurred in the subgroup index from February last year to February this year due to sharp price drops of 32.2 percent for fresh haddock fillets and 22.8 percent for fresh shrimp. However, during the same period shucked oyster prices rose 10.4 percent.

The wholesale price index for frozen processed fish and shellfish in February 1960 was higher by 2.1 percent as compared with January this year. Frozen shrimp prices increased (about 3 cents a pound) and frozen ocean perch fillets were up about 1/2 cent a pound in February as compared with the preceding month. From February last year to February this year the subgroup index was down 19.8 percent, due primarily to a 26.2-percent decline in frozen haddock fillet prices and a 22.2-percent drop in frozen shrimp prices. In addition, frozen flounder and ocean perch fillets were lower by 9.7 percent and 11.3 percent, respectively.

From January to February this year wholesale canned fish prices were unchanged. The index for the canned subgroup has moved over a narrow range of less than 1 percent since August 1959. As compared with February a year ago, primary canned fish prices in February this year were higher by 5.1 percent. In February 1960, prices were up 10.0 percent for canned pink salmon, 6.4 percent for Maine sardines, and 8.4 percent for California sardines. However, canned tuna prices in February this year were down 1.8 percent from February a year ago. As of the end of February this year, canned tuna was the principal canned fish with substantial stocks. Stocks of Maine sardines were light. Stocks of both California sardines and Pacific salmon were extremely light with 5-8 months remaining before new packs become available.



## Virginia

### FISH EGGS AND LARVAE SURVEYS IN OCEAN WATERS CONTINUED:

The biologists of the Virginia Fisheries Laboratory, Gloucester Point, aboard the M/V Pathfinder continued surveying the ocean waters off Virginia's coast for fish eggs and larval fishes during January 1960.

The biologists reported large numbers of what appeared to be larval menhaden in the water 30-40 miles offshore. On the first cruise to ocean waters in December 1959, large numbers of fish eggs were collected and an abundance of larval flounders less than  $\frac{1}{8}$ -inch long. Hake larvae were also abundant, but only one larval croaker was collected. One of the puzzles which the Laboratory is trying to solve is the location of the spawning grounds and movements of croakers, spot, and other important fish.

Water temperatures off the coast in the third week of January were between 40° and 45° F. and surface temperatures in Virginia eastern shore inlets were about 34° F.

Note: Also see Commercial Fisheries Review, February 1960 p. 33.



### TWO OF 1959'S "TWENTY BEST" SANDWICHES FEATURED FISH

Since 1956, the National Restaurant Association and the Wheat Flour Institute have sponsored an annual National Sandwich Idea Contest and "August is Sandwich Month" promotion. More than 800 entries were received in 1959 from restaurant owners and employees. From these the 20 best new ideas for sandwich combinations were picked and presented at the National Restaurant Convention at the Navy Pier in Chicago. The sandwich ideas were scored on the basis of practicability, suitability to various types of restaurant service, appearance, newness, and flavor. Two of 1959's "twenty best" sandwiches featured fishery products, whereas 5 of the 20 featured fish in 1958.