

TRENDS AND DEVELOPMENTS

Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 10-- A SEA SLED TO TOWING VESSEL COMMUNICATION METHOD:

For some types of fishing gear research, SCUBA divers employ a diving sled towed by the vessel towing the gear being studied (Sand 1956, Holt 1960). This technique permits continuous observation, photography, and measurement of gear under normal operating conditions. Lack of communication between divers and the towing vessel is a serious limiting factor in operations in which sleds are used. The U. S. Bureau of Commercial Fisheries Gear Research Unit at Pascagoula, Miss., has recently developed a one-way communication method as a partial solution to this problem (fig. 1).

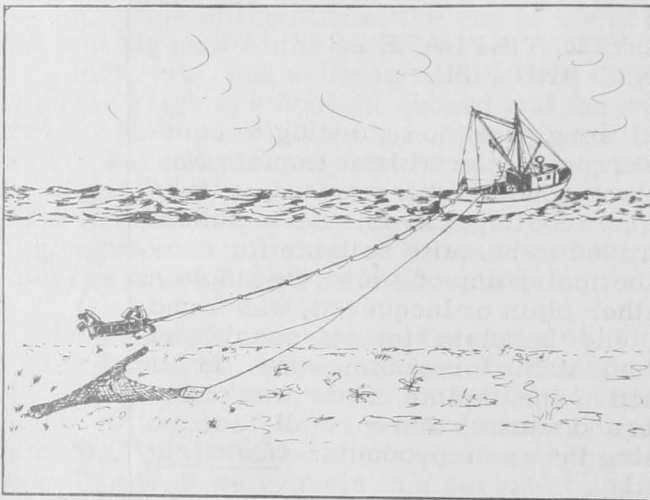


Fig. 1 - A pictorial view of the sea sled in use. The communication conductor runs from the vessel to the sled along the towing cable.

The method utilizes the following equipment (fig. 2).

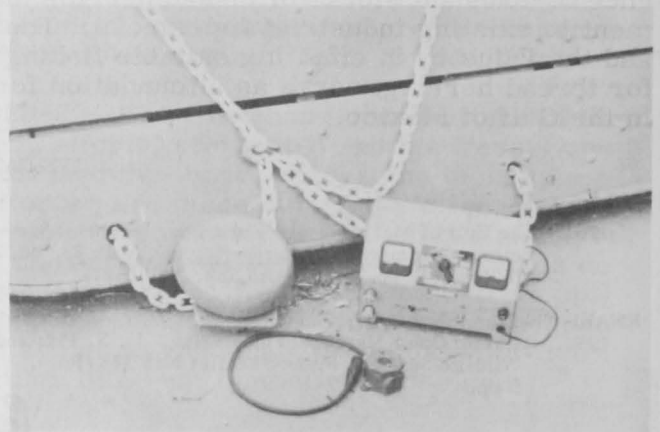


Fig. 2 - The bridge-mounted signal bell, 12-volt d.c. power supply, and the sled-mounted signaling switch with watertight connector attached. An electrical conductor (not shown) connects these components.

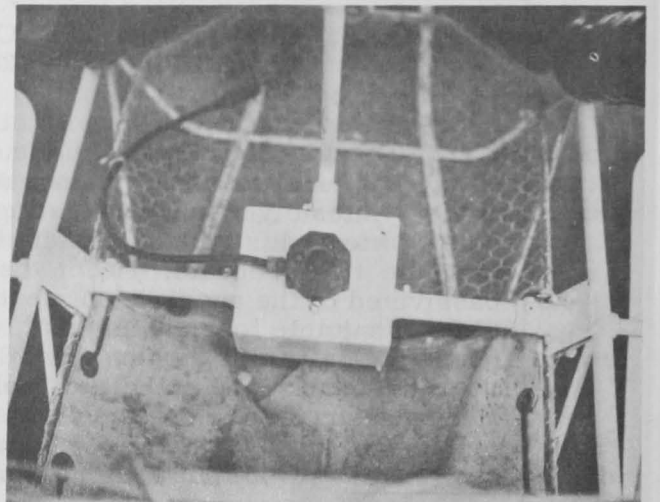


Fig. 3 - Signaling switch mounted on the sea-sled control box.

A signal button; a 12-volt d.c. power supply; a standard 12-volt alarm bell; and an

electrical conductor between components. The signal button is filled with castor oil so that water pressure will not set off the signal and so that water will not enter the button. The signal button is located on the control box of the sled and is joined to the electrical conductor through a watertight connector (fig. 3). The conductor is standard 750-ohm television aerial lead-in wire with metal rings attached at 2-fathom intervals. The sled topline, which runs from one drum of the trawling winch, passes through all of the rings. The unused length of conductor is kept folded at the stern where it is suspended from the rings (fig. 4). The power supply and signal bell are mounted on the bridge.

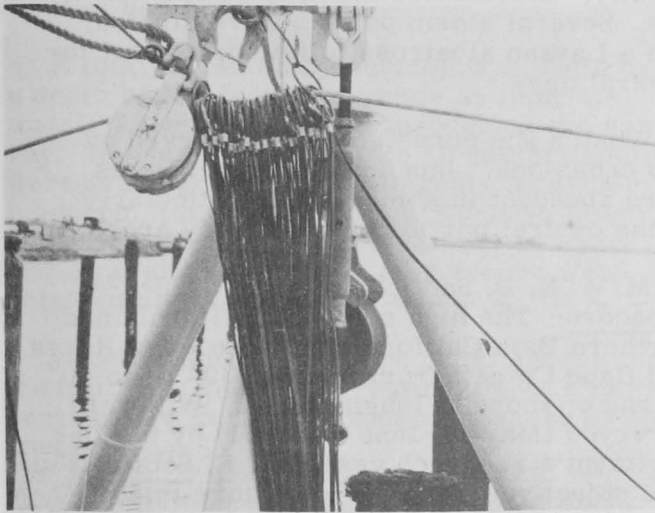


Fig. 4 - The conductor wire hanging from its supporting rings. The sea-sled topline passes through all of the rings.

A signal code, prepared before the divers enter the water, is used to transmit the wishes of the divers to the crew of the towing vessel. In this way changes affecting speed, wire scope, or other factors can be made effectively and simply without the time-consuming necessity of surfacing. The method also is an improvement in diving safety procedures, in that the vessel can be signaled immediately in the event of an accident to one of the divers or to equipment.

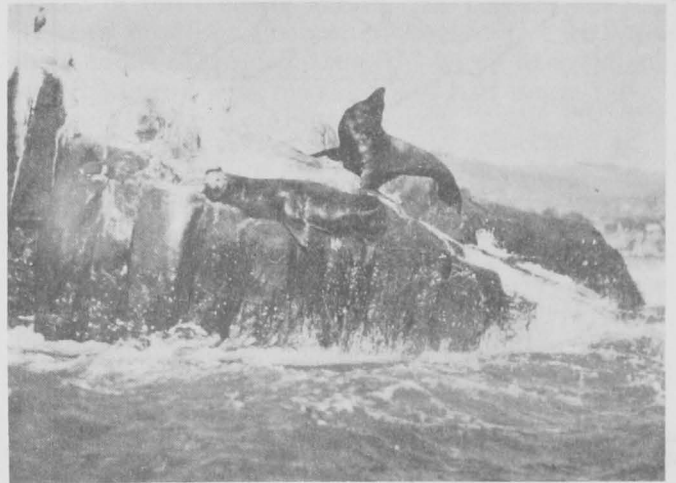
The primary deficiencies of the method are that communication is possible in one direction only and the number of prearranged operations permitted is limited owing to the necessity of keeping signals simple.

--By John K. Holt
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California

AERIAL CENSUS OF SEA LIONS:

Airplane Spotting Flight 61-7-Sea Lion Census: An aerial survey of the coast and offshore islands from Pismo Beach and the Oregon border to Pt. Conception was conducted by the California Department of Fish and Game Twin Beechcraft on June 6-9, 13, and 19, 1961, to estimate the abundance of sea lions in California. Significant concentrations of sea lions were found on Turtle Rocks off Patrick Point, Sugar Loaf off Cape Mendocino, Sea Lion Rocks off the Mattole River, Jackass Gulch south of Shelter Cove, Cottaneva Needle near Cape Vizcaino, rocks off Fort Ross, Point Reyes, Farallon Islands, Ano Nuevo Island, Santa Cruz Point, Partington Point, Cape San Martin, Point Piedras Blancas, West end of San Miguel Island, Santa Barbara Island, San Nicolas Island and the west side of San Clemente Island. Individuals and lesser numbers were found intermittently between those places.



California sea lions on Twin Rocks, Laguna, Calif.

Photographic equipment used included a 9" x 9" vertical aerial camera mounted in the floor of the Beechcraft, a K-20 manually-operated aerial camera, and a 35-mm. color camera. Photographs were taken wherever significant concentrations of sea lions were encountered. Actual counts and estimates were made in areas where only small numbers of animals were found.

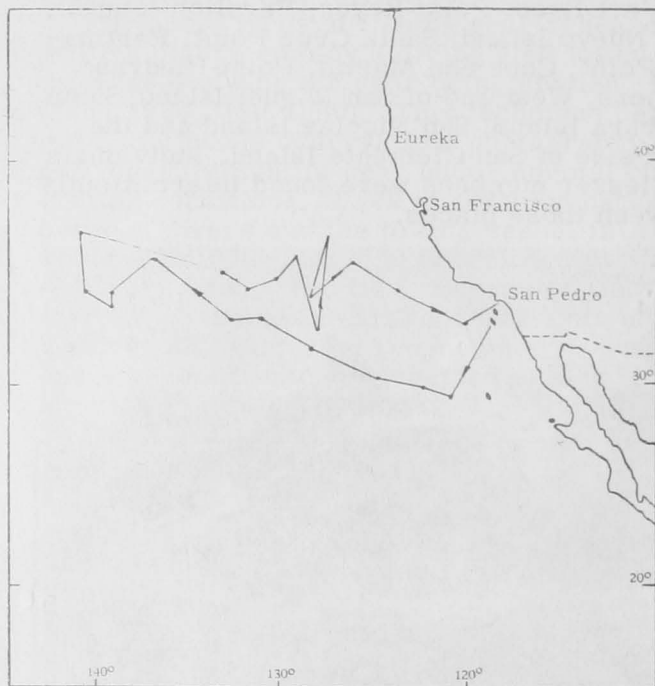
Weather conditions, for the most part, were ideal and the census was completed without undue delay because of coastal fog so often present in the past during June.

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ALBACORE TUNA OFF CALIFORNIA AND BAJA CALIFORNIA STUDIED:

M/V "Alaska" Cruise 61-A-4-Albacore:

The high seas off California and Baja California between Monterey and Guadalupe Island from latitude $29^{\circ}00' N.$ to $36^{\circ}40' N.$ and offshore to longitude $141^{\circ} W.$, were surveyed by the California Department of Fish and Game research vessel Alaska from May 9-June 13, 1961. The objectives were (1) to explore the offshore area in an attempt to intercept and determine the migration route of albacore approaching the Pacific Coast fishing grounds; and (2) to describe environmental conditions, relative to albacore occurrence, by collecting various physical and biological data.



M/V Alaska Cruise 61-A-4-Albacore (May 9-June 13, 1961).

Approximately 3,000 of the 3,400-mile vessel track were fished with surface trolling gear. No albacore were caught or observed in the area covered.

Temperatures in most of the survey area were suitable for albacore. The warmest sea-surface temperature recorded was $65.1^{\circ} F.$ some 1,140 miles west of San Pedro (latitude $33^{\circ}30' N.$, longitude $139^{\circ}34' W.$). The coolest was $57.2^{\circ} F.$ about 240 miles west of San Pedro (latitude $33^{\circ}45' N.$, longitude $123^{\circ}01' W.$)

A total of 109 bathythermograph casts to 450 feet was made, each at approximately 20-mile intervals. Sea-water samples for

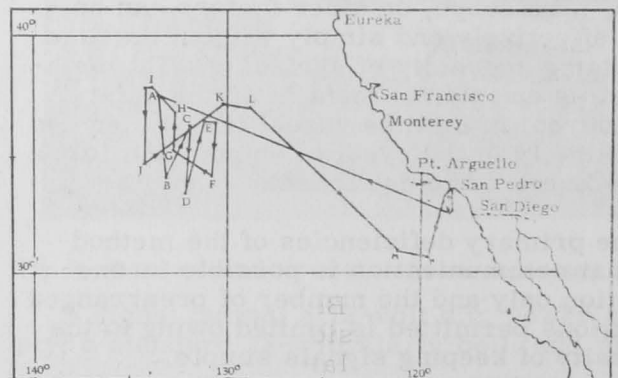
salinity analysis were collected by means of 10-meter Nansen bottle casts at alternate bathythermograph stations.

Eleven night-light stations were occupied. Pacific sauries, Cololabis saira, were present at all stations. Jack mackerel, Trachurus symmetricus, to 20 inches in length were observed at several stations east of longitude $130^{\circ} W.$ A few lanternfish, Myctophum affine, and several unidentified squid and salps were present at nearly all stations. A pelagic shark (Euprotomicrus bispinatus) was collected about 1,000 miles offshore.

Daytime observations were logged frequently. Blackfooted albatross were numerous. Several storm petrels were sighted, and a Laysan albatross followed the boat for several days.

Whales and porpoise were observed on two occasions. Japanese glass net floats were abundant in some areas particularly in the central portion of the survey area.

M/V "N. B. Scofield" Cruise 61-S-3-Albacore: The high seas off California and northern Baja California between Point Reyes and Cape Colnett from latitude $30^{\circ} N.$ to $40^{\circ} N.$ and offshore to longitude $135^{\circ} W.$, were surveyed (May 19-June 17, 1961) by the Department's research vessel N. B. Scofield. The objectives were (1) to explore this offshore area in an attempt to intercept and determine the migration route of albacore approaching the Pacific Coast fishing grounds; and (2) to describe environmental conditions, relative to albacore occurrence, by collecting various physical and biological data.



M/V N. B. Scofield Cruise 61-S-3-Albacore (May 19-June 17, 1961).

Surface trolling gear was used to fish along more than 75 percent of the 3,200-

mile vessel track. No albacore were caught and there was no evidence of their presence in the area covered.

Sea-surface temperatures in most of the survey area were suitable for albacore. A thermograph provided continuous records of sea temperature approximately 6 feet below the surface. At the surface and at 10-meters, temperatures were obtained at regular intervals with bucket and reversing thermometers. At all 3 near-surface depths the coolest water (53° to 54° F.) was encountered early in the survey west of San Clemente, San Nicolas, and Santa Cruz Islands. Warmest temperatures (64° to 66° F.) at these depths were encountered 300 to 500 miles west of San Francisco.

A total of 145 bathythermograph casts to a depth of 450 feet were made at approximately 20-mile intervals throughout the survey. Nansen bottle casts to 10-meter depths were made generally at alternate bathythermograph stations or at about 40-mile intervals. A water sample for salinity analysis and a reversing thermometer record were obtained at 81 stations.

Weather conditions were excellent for the most part. Of 146 observations, only 6 percent showed northwest winds in excess of 20 knots.

A night-light station was occupied on 14 occasions while the vessel drifted on sea anchor. Pacific sauries, *Cololabis saira*, were observed at every station in numbers varying from 6 to several hundred. A small sample was obtained from each station. Several lanternfish, *Myctophum affine* and *Centrobranchus nigroocellatus*, a juvenile jack mackerel, *Trachurus symmetricus*, one small shark (*Euprotomicrus bispinatus*), a medusafish, *Ichthyos lockingtoni*, and many invertebrates also were collected.

Daytime observations were logged frequently. The blackfooted albatross was the most common bird sighted offshore. Also observed were 3 species of storm petrels, some shearwaters, some terns, a jaeger, and a white albatross. Blue sharks were observed on several occasions. Marlin were seen jumping twice. A large pack of killer whales were observed about 300 miles west of San Francisco. Numerous Japanese glass net floats of various sizes were observed west of the 135th meridian.

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MIDWATER TRAWLING FOR SALMON FINGERLINGS CONTINUED:

M/V "Nautilus" Cruises 61-N-11 and 61-N-12-Salmon: The midwater trawl operations of the California Department of Fish and Game research vessel *Nautilus* were continued (June 5-9 and June 19-23, 1961) in the Carquinez Strait to capture marked salmon fingerlings. All midwater trawling for marked salmon fingerlings was conducted between 7 a.m. and 3 p.m. and each tow was for 20 minutes. Tows were alternated between upstream and downstream, and between the north shore, center, and south shore of the channel. A flow meter was used to measure the amount of water strained by the net on each tow.

During the 92 tows completed, a total of 309 king salmon (*Oncorhynchus tshawytscha*) fingerlings was captured--catch per tow varied from zero to 22. A total of 17 marked salmon was recovered, 15 from releases made at Rio Vista, 1 from releases made in San Pablo Bay (approximately 2 miles seaward of the fishing area), and 1 from releases made at Coleman Hatchery. Two rainbow trout (*Salmo gairdneri*) were also taken; one of these was marked and had been released in the American River.

Other species appearing in the catch, listed in order of abundance, were: northern anchovy (*Engraulis mordax*), Pacific herring (*Clupea pallasii*), striped bass (*Roccus saxatilis*), American shad (*Alosa sapidissima*), jack smelt (*Atherinopsis californiensis*), Northern midshipman (*Porichthys notatus*), and starry flounder (*Platichthys stellatus*).

One trip was made outside the Golden Gate along Baker Beach. Three trawls were made in the area between Mile Rock light-house and the Golden Gate bridge. The first set offshore from Baker Beach at the surface produced 1 fingerling salmon. The second set in the same area with diving doors--net at approximate depth of 50 feet--produced 29 salmon. The third set away from the beach in deeper water with the net at approximately 60 feet produced no salmon. On the return to Carquinez Strait, one set was made east north-east of Angel Island. No salmon were caught in this area.

Note: Also see *Commercial Fisheries Review*, Aug. 1961 p. 19.



Cans--Shipments for Fishery Products, January-May 1961

Total shipments of metal cans during January-May 1961 amounted to 52,940 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 49,682 tons in the same period a year ago. Canning of fishery products in January-May this year was confined largely to tuna, shrimp, Gulf oysters, and jack and Pacific mackerel.



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.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-APRIL 1961:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, about 1.9 million pounds (value \$988,000) of fresh and frozen fishery products were purchased in April 1961 by the Military Subsistence Supply Agency. This was higher than the quantity purchased in March by 21.3 percent and 15.6 percent above the amount purchased in April 1960. The value of the purchases in April this year was up 40.9 percent as compared with March and was 3.1 percent higher than for April a year ago.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, April 1961 with Comparisons

QUANTITY				VALUE			
April		Jan.-Apr.		April		Jan.-Apr.	
1961	1960	1961	1960	1961	1960	1961	1960
..... (1,000 Lbs.) (\$1,000)			
1,902	1,646	7,069	6,894	988	958	3,535	3,688

During the first 4 months of 1961 purchases totaled about 7.1 million pounds (valued at \$3.5 million)--an increase of 2.5 percent in quantity, but lower by 4.1 percent in value as compared with the same period in 1960.

Prices paid for fresh and frozen fishery products by the Department of Defense in

April 1961 averaged 51.9 cents a pound, about 7.2 cents above the 44.7 cents paid in March and 6.3 cents less than the 58.2 cents paid during April last year.

Canned Fishery Products: Tuna was the principal canned fishery product purchased

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, April 1961 with Comparisons

Product	QUANTITY				VALUE			
	April		Jan.-Apr.		April		Jan.-Apr.	
	1961	1960	1961	1960	1961	1960	1961	1960
 (1,000 Lbs.) (\$1,000)			
Tuna	1,297	13	2,662	1,282	572	8	1,175	581
Salmon	2	-	2	-	2	-	2	-
Sardine	21	15	81	61	10	6	39	26

for the use of the Armed Forces during April this year. In the first 4 months of 1961, purchases of canned tuna were up 107.6 percent from the same period of 1960.

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-MAY 1961:

Fresh and Frozen Fishery Products:

For the use of the Armed Forces under the Department of Defense, 2.2 million pounds of fresh and frozen fishery products were purchased in May 1961 by the Military Subsistence Supply Agency. This was higher than the quantity purchased in April by 16.2 percent and 3.9 percent above amount purchased in May a year ago. The value of the purchases in May this year was up 8.7 percent as compared with April, but was 2.6 percent less than for May last year.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, May 1961 with Comparisons

QUANTITY				VALUE			
May		Jan.-May		May		Jan.-May	
1961	1960	1961	1960	1961	1960	1961	1960
..... (1,000 Lbs.) (\$1,000)			
2,210	2,128	9,279	9,022	1,074	1,103	4,609	4,791

During the first 5 months of 1961 purchases totaled 9.3 million pounds (valued at \$4.6 million)--an increase of 2.8 percent in quantity but a decrease of 3.8 percent in value as compared with the same period in 1960.

Prices paid for fresh and frozen fishery products by the Department of Defense in May 1961 averaged 48.6 cents a pound, about 3.3 cents less than the 51.9 cents paid in April and 3.2 cents less than the 51.8 cents paid during May last year.

Canned Fishery Products: Canned sardines was the only canned fishery product purchased for the use of the Armed Forces during May this year. In the first 5 months of 1961, purchases of canned sardines were

Product	QUANTITY				VALUE			
	May		Jan. - May		May		Jan. - May	
	1961	1960	1961	1960	1961	1960	1961	1960
 (1,000 Lbs.) (\$1,000)			
Tuna	-	1	2,662	1,283	-	1/	1,175	581
Salmon	-	-	2	-	-	-	2	-
Sardine	8	1	89	62	4	1/	43	26

1/Valued at less than \$500.

up about 43.5 percent and canned tuna purchases were up 107.5 percent as compared with the same period in 1960. Only 2,000 pounds of salmon was purchased during first five months of 1961 as purchases of this product are usually made in the fall months or about at the end of the spring and summer salmon canning season.

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.



Films

SPONGE FILM SELECTED FOR INTERNATIONAL SHOWINGS:

Another U. S. Department of the Interior film, Sponge--Treasure from the Sea, has been selected for showing at internationally-prominent film festivals. The film was sponsored by the Sponge and Chamois Institute and produced by the U. S. Bureau of Commercial Fisheries. It has already received honors at the American Film Festival.

Sponge--Treasure from the Sea is a sound-color portrayal of the natural sponge industry in the United States. Most of it was filmed at Tarpon Springs, Fla., the center of the natural sponge industry in this country. Old World ceremonies and music add interest to the picture.

The film has been selected for showing at the Edinburgh, Scotland, International Film Festival and at the Venice, Italy, International Film Festival where it vies for honors with films from more than 35 countries. Selections of United States Government films for international showing are made by the Inter-Departmental Committee



Vessels operating in the sponge fishery docked at Tarpon Springs, Fla., with their harvest of sponges. Sponges are being hung out to dry.

on Auditory and Visual Aids for Distribution Abroad. Arrangements for showing Government films at foreign film festivals are made by the U. S. Information Agency and the Department of State.

For the Edinburgh showing there will be a prescreening in London and another preview in Edinburgh before final selection. There is also a prescreening step at Venice.

Three Bureau of Commercial Fisheries films have won awards at Edinburgh and three in Venice.

Note: See Commercial Fisheries Review, Jan. 1961 p. 34.



Fisheries Loan Fund

LOANS APPROVED, APRIL 1-JUNE 30, 1961:

From the beginning of the program in 1956 through June 30, 1961, a total of 961 applications for \$28,949,169, have been received. Of these, 511 (\$12,013,809) have been approved, 328 (\$8,606,482) have been declined or found ineligible, 90 (\$5,104,066) have been withdrawn by applicants before being processed, and 32 (\$1,961,455) are pending. Of the applications approved, 196 were approved for amounts less than applied for and the total reduction was \$1,263,357.

The following loans were approved April 1-June 30, 1961:

New England Area: Bluewaters, Inc., Gloucester, Mass., \$80,000; Ruth and Helen, Inc., Newport, R. I., \$15,000; Sunapee, Inc., North Dartmouth, Mass., \$21,000; and Wilhelmsen Fishing Corp., North Dartmouth, Mass., \$40,700.

South Atlantic and Gulf Area: Gail Emma, Inc., Tampa, Fla., \$22,000; E. L. Gant, Port O'Connor, Tex., \$8,600; Jackson Seafood Co., Rockport, Tex., \$25,000; J. H. Morgan, McIntosh, Ga., \$5,000; Warren H. Rector, Awendaw, S. C., \$8,000; Sea Cat, Inc., Tampa, Fla., \$17,000; Thomas A. Smirch, St. Augustine, Fla., \$19,800; St. George Seafood Co., Inc., Tampa, Fla., \$24,100; and Lathan Willis, Harkers Island, N. C., \$9,600.

California Area: Charles H. Hastings, Eureka, \$9,500 and Charles L. White, San Diego, \$3,000.

Hawaii Area: M. Hamabata and S. Tokumine, Honolulu, \$4,000 and Tatsuo Hayashi, Honolulu, \$5,400.

Pacific Northwest Area: Wm. J. and J. T. Haavisto, Ilwaco, Wash., \$7,690; John Honegger, Portland, Oreg., \$10,000; Ernest A. Peterson, Astoria, Oreg., \$2,000; Donald Truex, South Beach, Oreg., \$6,500; and Wm. H. Wood, Seattle, Wash., \$14,000.

Alaska: John M. Griffin, Ketchikan, \$6,500.

Fishing Vessel Mortgage and Loan Insurance

CASES APPROVED, APRIL-JUNE 1961:

The Federal Fishing Vessel Mortgage and Loan Insurance Program was implemented the latter part of 1960 as a result of enabling legislation passed by the Congress in that year. Administered by the U. S. Bureau of Commercial Fisheries, the program provides for Federal Government insurance of mortgages and loans for construction, reconstruction, and reconditioning of fishing vessels. The first three insured mortgages and loans under the program were approved prior to April 1, 1961. During the April-June 1961 period the following insured mortgage and loan was approved:

New England Area: Sylvester Maloney, New Bedford, Mass., \$60,000.

Fish Flour

STATEMENT BY CONGRESSMAN KEITH:

A statement on fish flour made by Congressman Hastings Keith of Massachusetts was published in the Congressional Record appendix of June 19, 1961. The principal portion of the statement follows:

Use of fish and marine animals as a source of protein has been seriously hampered by inferior means of harvesting, processing, and storage. But, now, with more advanced fishing techniques and more than 5 years of experimentation, a practical method has been perfected to meet the urgent demand to supply the two billion undernourished people of the

world with an abundant and inexpensive source of protein to supplement their native diets.

This remarkable new food from fish could be of firstline importance to the stepped up freedom from hunger campaign of the United Nations and our own food for peace program—one of the agencies which may be used to combat the crucial situation in Brazil. It could also, conceivably, be a major boon to the ailing American fishing industry.

Known as whole fish flour, it is more accurately described as fish protein concentrate, and appears to be the most efficient product yet developed for converting protein from the sea into human food.

A tasteless and odorless powder, fish flour is made from the whole fish and is the world's cheapest, most abundant and biologically richest source of animal protein—two and a half times the food value of milk powder at the same cost. One of its chief qualities is an ability to withstand adverse storage conditions, and it is particularly suited to the unrefrigerated facilities of the tropics. As a human food it has growth-promoting characteristics that surpass even the widely used flour made from soybeans.

The VioBin Corp. of Monticello, Ill., a pharmaceutical preparation company, has set up a pilot plant for the production of fish flour in New Bedford. Early cost estimates indicate it can be successfully produced at a price of only 14 cents a pound, with a protein content in excess of 80 percent by weight.

Considering the great world need for protein of high quality, the market for fish flour is limitless. The source, too, is virtually inexhaustible, as the raw material is not prime fish—commercially marketed—but sizes and species of fish which until now have been cast from the nets as worthless by the industry.

The exciting potential of such a food is illustrated by the fact that 1 million tons of fish flour could provide the annual protein requirements of 100 million people.

This food supplement is now being used and tested on a limited scale in 48 nations. In cooperation with ICA and various other organizations it has undergone exhaustive study. In El Salvador, where one such test was conducted, the introduction of fish flour into the native diet brought amazing results. Mixed with other foods, it "markedly increased the rate of weight and height gains in children exhibiting various degrees of malnutrition and tended to increase the resistance of the subjects against illnesses and intercurrent infection."¹

This should be wonderful news—a genuine breakthrough in the age-old fight against hunger and illness.

Unfortunately, however, there is still a serious obstacle to the worldwide distribution of fish flour. As a new food product, this dietary supplement is subject to the approval of the Food and Drug Administration. Such approval has been withheld because the FDA takes the position fish flour is "adulterated" and therefore unfit for human consumption because it is made from the whole fish. Our sources report this is not a health question, but what has been termed an "esthetic judgment."

¹From a report published in 1958 by the University of El Salvador's Instituto Tropical De Investigaciones Cientificas.

FDA has argued the average American consumer would reject fish flour as a food on esthetic grounds. In defense, proponents point out that the use of whole fish—dried, defatted, deodorized and reduced to a fine powder—should be more attractive from an esthetic standpoint than oysters, sardines, clams and other seafoods which we all enjoy and which are eaten whole or often contain the viscera.

In an effort to satisfy FDA that fish flour will be a uniform, high-quality product for the benefit of the consumer and that the consumer would be protected by accepted food handling techniques and standards of sanitation, a strict "standard of identity and definition for whole fish flour" is being prepared. These standards are being drawn up by the Bureau of Commercial Fisheries in conjunction with the manufacturer, Dr. Ezra Levin, and Harold Putnam, counsel for the Senate Select Committee on Small Business.

It is anticipated FDA will publish the standards in the Federal Register and subsequently conduct a public hearing on the question of whether whole fish flour should be permitted to be marketed for human consumption in the United States. The hearing will probably be this fall.

At such a hearing, the weight of public opinion will, of course, play a vital role in obtaining a favorable decision, as will the amount of support received from Members of Congress, the administration, and health and nutrition experts.

It is particularly important, if only from a psychological standpoint, that this health-giving discovery have the full endorsement of the U.S. Government before we attempt to distribute it to underdeveloped countries, where the need is greatest and where field tests are now being conducted with fish flour by U.S. agencies or agencies which are sponsored in part and endorsed by the United States.

Its value in such a program as food for peace, in Brazil or elsewhere, would be utterly destroyed if it carried overseas a labeling branding it "unfit" for Americans, even though a present exemption in our law allows for exportation.

In a joint statement issued by Senators SALTONSTALL and SMITH of Massachusetts, it was rightly pointed out that in the development of this protein-rich food there has been no scientific "lag" by the United States. They added:

All the information we have indicates we are years ahead of the Soviet Union. But, it is important that we stay ahead.

If we do not push boldly on, we expect Russia will be ready in a short time with an acceptable process and once its fish flour is available we are sure there will be no delay in Russia pouring its production out to all corners of the hungry earth.

Fish flour offers great promise to our foreign policy by helping in a positive sense those people President Kennedy spoke of in his Inaugural Address, "in the huts and villages of half the world, struggling to break the bonds of mass misery."

Its continued development and effective production is a challenge to us and to our fishing fleets. The profitable use of that untapped mine of industrial fish in waters off our shores presents a dramatic possibility, as well, for the domestic economy.

However, all the significant benefits of fish flour can be lost. The officials who must make the final judgment as to its desirability as a human food must be assured that an "aesthetic objection" alone—if indeed one exists—should not delay the worldwide distribution of a product that could become a singularly effective weapon in our global war for peace.



Fish Meal

VARIABLE QUALITY THEORY BEING TESTED:

Chick-feeding tests on 7 samples of fish meal obtained from Gulf of Mexico menhaden plants were completed as of June 1961 by the College Park (Md.) Technological Laboratory of the U. S. Bureau of Commercial Fisheries. The tests showed (1) an extremely wide range in quality for such a small series; (2) excellent correlation to the quality predicted from the knowledge of sample histories. This prediction was based upon the application of the hypotheses developed from the findings of last season's meal-testing program.

Sufficient additional samples had been received in June from plants visited to start a second test series. This series, it is hoped, will substantiate the theories explaining variable meal quality and enable the recommendation of processing changes to eliminate the variables in fish meal quality.



Freezing-Fish-at-Sea

NEW FREEZING SOLUTION SOUGHT:

That groundfish (cod, haddock, hake, pollack, etc.) can be satisfactorily preserved by brine-freezing at sea has been demonstrated by research at the Gloucester (Mass.) Technological Laboratory of the U. S. Bureau of Commercial Fisheries. Sodium chloride brine, however, has serious drawbacks, and a new freezing medium is needed.

The Gloucester Laboratory has let a contract to the University of New Hampshire on "Development of Solutions for Immersion-Freezing Fish at Sea." Research efforts will be directed toward finding inexpensive or easily refinable and re-usable

solutions that are non-toxic, have a freezing point around 20° F. and have a low viscosity at low temperatures. Solutions approaching these requirements will be tried on a laboratory and pilot-plant scale.



Frozen Foods

CODE ADOPTED BY AFDOUS:

Over 250 regular and associate members of the Association of Food and Drug Officials of the United States (AFDOUS) convened at their 65th Annual Conference on June 19, 1961, in Washington, D. C. The meeting ended on June 23. Of particular interest to the frozen fish industry was the action taken by the Conference on the regulations of frozen foods. The Association adopted the Frozen Foods Code.

The 64th Annual Conference at Dallas, Tex., adopted the Report of the Frozen Foods Standards subcommittee which recommended that eight sections of the Frozen Foods Code be forwarded to the Committee on Editing and Format in order that they be put in final form for passage in 1961. These sections included provisions for retail, warehousing, transportation, construction and layout, equipment, and frozen food handling in general. Since it was deemed that additional scientific data were needed, no provisions for bacterial limits were made.

The Canned, Processed and Frozen Foods Committee of AFDOUS convened in Washington during the Conference at which time copies of the proposed code as prepared by the AFDOUS Subcommittee on Editing and Format were reviewed and comments of the Editing and Format Subcommittee, as well as those of the Frozen Foods All-Industry Coordinating Committee were given full consideration. A list of changes, considered to be justified by the Committee, was prepared and made a part of the code. The Voluntary Industry Operating Practices which was prepared by the Frozen Foods All-Industry Coordinating Committee were reviewed and it was generally agreed by the AFDOUS Committees that the industry operating practices followed very closely the AFDOUS Code in temperature requirements. The Industry Voluntary Operating Practices for Transportation Equipment will equal the AFDOUS Code requirements by 1963 and call for 0° F. with a 5° F. tolerance by 1965, which tolerance is 5° F. lower than the permitted tolerance in the AFDOUS Code.

The AFDOUS Committee on Canned, Processed and Frozen Foods reaffirmed its views that a voluntary industry self-policed program cannot substitute for an AFDOUS Code. The 20° F. tolerance for delivery trucks and the statement that new refrigerated transportation equipment, purchased after March 1, 1961, will be capable of achieving only 5° F. temperatures, were the principal weaknesses in the Voluntary Industry Practices, according to the AFDOUS Committee. The Committee felt that since 0° F. is the industry goal, equipment purchased after the AFDOUS Code is adopted should be capable of holding frozen foods at 0° F.

The Committee then made the following recommendations which were adopted by the Association: "(1) In the absence of adequate information for the establishment of bacterial limits for frozen foods, the Committee recommends that this question be referred to a subcommittee of microbiologists, to be appointed by the Chairman, to develop definitive recommendations on this subject. Under a broad charter this subcommittee would be concerned with further simplification and development of uniform methods of analysis and the interpretation of the microbiological findings obtained; (2) the Committee recommends that the proposed Frozen Foods Code as prepared by the Subcommittee on Editing and Format and



Peeled deveined shrimp laid out individually on large trays. Trays are placed in a roller rack holding 15 trays. Full rack being wheeled into blast freezer for freezing.

as amended by the Canned, Processed and Frozen Foods Committee, be accepted by AFDOUS and published in the Association's Quarterly Bulletin. The Committee further recommends that at the time it is published, it be made available to States and Municipalities for their adoption."

Members of the fishing industry should take particular note of the Committee's report to the Association, that a "self-policing program cannot substitute for an AFDOUS Code." It is now the goal of the majority of the membership of AFDOUS to go back home and start the ball rolling to enact implementing legislation.



Fur Seals

INTERNATIONAL TREATY NEGOTIATED 50 YEARS AGO:

Fifty years ago steps were taken which saved a remnant seal herd in the North Pacific from probable extinction and built it into a valuable and continuing resource, the Secretary of the Interior announced on July 2.

It was on July 7, 1911, that four nations--Japan, Russia, Great Britain (for Canada), and the United States--signed the fur seal treaty ending the killing of fur seals on the high seas in the North Pacific and providing a formula for sharing the kills made on rookeries. Provisions for policing the treaty were included. The clause which ended pelagic sealing cleared the way for an effective conservation program and provided the basis for the United States to initiate effec-

tive conservation practices on the Pribilof Islands fur seal rookeries.

World War II disrupted this first treaty agreement but on February 9, 1957, the four nations (Canada signing for Canada) signed a new treaty which became effective in October of that year. A Canadian-United States agreement had been in effect during the interim period. The new treaty was similar in most respects to the old one--pelagic sealing was banned except for certain research operations and for natives using primitive methods and using the harvest for sustenance; the principle of sharing the harvest on the rookeries was maintained but the formula changed somewhat; policing was provided; and a new coordinated research program was instituted which made possible not only research on a single herd but provided for studies to determine whether or not there was any interrelationship between the various North Pacific fur seal herds.



Fig. 1 - "Fur seals sporting around the baidar--Natives of St. Paul lightering off the bundled sealskins to the ship from the Village Cove." A sketch by Henry W. Elliott, who visited the Pribilofs for the Treasury Department and the Smithsonian Institution in 1872, shortly after purchase of the islands from Russia. The baidar, or bidarra, was made of sea lion skins; canvas-covered bidarrahs are still used in ship-to-shore ferrying.

In the 1911 treaty, the rookery-owning nation kept 70 percent of the harvest and the other 30 percent was divided among the other nations. In the present treaty, Japan and Canada each got 15 percent of the United States harvest on the Pribilof rookeries and a like percentage of the Russian harvest on Robben Island and Commander Islands off the Asian coast. The Pribilof herd supplies about 80 percent of the world's production.

As a result of conservation practices which the United States put into effect shortly after the signing of the 1911 treaty, the Pribilof herd has increased from approximately

132,000 in 1910 to 1,500,000 at the present time.

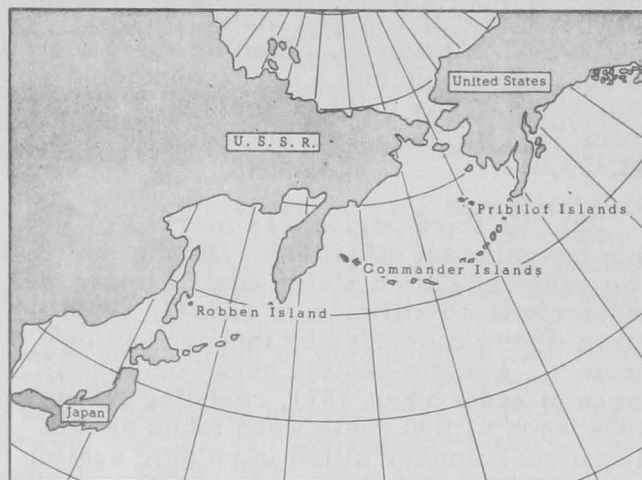


Fig. 2 - Breeding grounds of the northern fur seals: Robben Island (Kaihyōtō or Tyuleny Island) off Sakhalin; the Commander Islands (Bering Island and Medny or Copper Island) at the Soviet end of the Aleutian chain; and the Pribilof Islands--St. Paul Island, St. George Island, Otter Island, Walrus Island, and Sea Lion Rock.

There are five islands in the Pribilof group in the Bering Sea about 300 miles off the Alaska coast. The two largest are St. Paul, 14 miles in length, and St. George, 10 miles in length. The two islands are about 40 miles apart. Although Alaska was visited by Vitus Bering, Russian navigator, in 1741 and a great number of "sea bears" reported, it was not until 1786 that Gehrman Pribylof, another Russian navigator, discovered the islands which bear his name and which contain the great fur seal rookeries.

There are four periods of sealing history in the Pribilof Islands. The first such period of history began with the date of discovery and continued until 1834 when, because of the reduction of the herd, the Russian government placed restrictions on sealing operations. During that 48-year period, records show that two million fur seals were taken.

The second period is between 1834 and 1867, the year the Russians sold Alaska, including the Pribilofs, to the United States. During that time because of the reduced herd and restrictions about 600,000 skins were taken.

The third period began with the United States ownership and control of the islands and continued until 1910, a period marked by the practice of harvesting by contract or lease. From 1870 until 1890 the limit of kill

was 100,000 seals a year. This limit was reached practically every year, for the record shows that there were 2,006,136 seals taken and that the United States received \$6,020,152 in revenue. Then followed a drop in seal population and a corresponding drop in harvest. Only 330,603 seals were killed from 1891 to 1910 and the revenue was \$3,453,944.

But this third period was marked by two other significant situations. During the first two years of United States control there was indiscriminate killing with 225,901 skins taken on the rookeries by independent operators. Pelagic sealing began on a commercial scale about 1871, reaching a peak in 1894 when 61,800 seals were taken at sea. The actual number killed in pelagic sealing but not recovered in any year, or the number of seals which were wounded but escaped to die of injuries later, cannot be estimated.

The fourth and present period of Pribilof sealing is marked by direct management of the resource by the United States Government and the institution of scientific conservation practices.

When pelagic sealing was outlawed by the four nations, the door was opened to conservation of the rookeries. The United States immediately banned all killing on the Pribilofs for five years except that the natives were permitted to kill for food supply. This meant that only 2,500 to 3,500 seals were killed a year. Killing was resumed in 1918 and the records show that 34,890 skins were taken. Under the policy which had been established the killing was (and still is) done by Government employees and was restricted to the harvest of bachelor males of the three- and four-year-old class.

Females were given complete protection until 1955 when the biological studies indicated that the herd--scientifically estimated at 1,500,000--had stabilized at that figure and that disease and other natural causes were taking any excess. This meant that the time had come to end the protection which had been given the female and that henceforth the annual harvest of female would, under close supervision of the biologists, be standard management practice.

The seal take for the ten years ending in 1955 had been approximately 65,000 annually. Since the killing of females started, the an-

nual harvest has fluctuated because biological research on this phase of management is still in progress. The largest kill was in 1956; a total of 122,826 skins was harvested.

The economics of the fur seal is a story of its own. Until 1913 all raw seal skins were shipped to London for processing, for that art was known only to a small group of skilled English workers. When some of these workers were induced to come to the United States, a new American industry was born. It was located in St. Louis, Mo. The processing of a skin involves about 125 distinct operations. Each skin is handled separately.

With the taking of female skins a new problem was created. The process used in the preparation of male skins was not satisfactory for female skins. Intensive research followed and a sheared skin is now offered to the fur trade.

While the Government has retained all responsibility on each phase of the conservation and production of the seal resource, it has found it advantageous to contract the processing to a private firm, the Fouke Company of St. Louis, which has the sole contract for the preparation of the skins offered at the semi-annual auctions. These auctions are held in St. Louis each April and October. The receipts come to the Government after the contractual obligations are met.

The number of skins offered by the Government varies but approximates 25,000 at each sale. The price varies with the year and with the class of skin but the average approximates \$100 each.

Gross receipts from the sale of Pribilof Islands' products in fiscal years 1959 and 1960 amounted to \$9,201,182. Of this, \$3,096,129 was used to cover costs for handling, dressing, dyeing, and selling these products; \$3,442,308 was used to cover costs in administration of the Pribilof Islands; and \$1,863,921 represented net receipt payments to the State of Alaska pursuant to authority contained in Section 6 (e) of the Alaska Statehood Act. Net receipt of the United States Government, therefore, was \$798,824.

Another economic phase is the meal and oil produced by the reduction of the skinned carcasses.

Then, there is the human angle, the Aleut, who was brought to the once-unpopulated is-

lands as the top harvest hand. The Aleut and his modern, Government-built towns, the schools and the relocation problem for those whom the sealing industry will not support, is still another story.

This, then, is a brief sketch of an industry and a resource which can continue far into the future--the result of an action consummated on July 7, 1911.

Note: A complete summary of Pribilof Islands sealing operations is contained in Fishery Leaflet 516, "Fur Seal Industry of the Pribilof Islands," available from the U. S. Bureau of Commercial Fisheries, Washington 25, D. C.



Game Fish

PACIFIC MARINE GAME FISH RESEARCH LABORATORY PLANNED:

A marine game fish research center on the Pacific Coast is planned by the U. S. Bureau of Sport Fisheries and Wildlife. Application has been made to the Department of the Navy for use of unoccupied buildings at the Naval Net Depot at Tiburon, Calif., inside the Golden Gate on San Francisco Bay.

As of May 1961, initial efforts on the Pacific Coast have been on a modest scale. Temporary space has been at the University of California at Los Angeles.

Surveys of sport fishing areas, facilities, and use, which are in progress, will bring into focus the needs and problems of the Pacific Coast and will supplement the advice from state conservation departments and the Pacific Marine Fisheries Commission.



Great Lakes

EFFORTS TO UTILIZE ALEWIFE POPULATION IN LAKE MICHIGAN:

The Lake Michigan alewife is one of several species of fish in the Great Lakes that is not being fully utilized as food for other fish, such as lake trout, or by sport and commercial fishermen. These fish used to provide forage for the once-plentiful lake trout. When lake trout are reestablished, a certain part of the alewife and chub populations will be eaten by them. In the meantime, the abundant alewives and other species are

being wasted. The U. S. Bureau of Commercial Fisheries has been instrumental in introducing new types of gear that can harvest these underutilized fish economically. Traditional methods of fishing and handling are impractical as the present market value of such fish is very low compared to the more familiar Great Lakes commercial species.

The Bureau stepped into the industrial development picture of Great Lakes fisheries just a few years ago. The Bureau's activities have included: exploration to determine location and availability of underutilized fish stocks; assessment of the physical condition of fishing grounds; instructing fishermen how to use otter trawls and rig their vessels; improving methods of handling fish aboard vessels and ashore; developing new processing machinery; improving sanitary conditions; developing new products for human consumption; and locating and expanding industrial, animal, and human markets for fish. Most of this work is based on the findings of the Bureau's biologists which have conducted research on fish and their environment on the Great Lakes for many years.

Several trawl vessels are currently operating on Lake Michigan under temporary fishing permits. The newness of the fishery and its lack of stability have made it unattractive to prospective investors in the handling, processing, and marketing facilities necessary to put it on a sound operating basis. The otter trawl catches certain species of Great Lakes' fish in economical quantities, when they are sufficiently congregated and close to the lake bottom.

An example of the integrated Bureau effort to promote the use of alewives took place early in May this year. Alewives were particularly accessible at the time. Arrangements were made to catch and load a 15-ton lot of alewives aboard the Capitol I, a former Gulf of Mexico shrimp trawler now operated out of Saugatuck, Mich. The alewives were easily caught, with as much as 7,000 pounds taken in a single 10-minute drag. A fish pump, similar to those being used for handling menhaden on the Atlantic Coast, was used to transfer the fish from the vessel's hold to a watertight semitrailer. The trailer was provided by a Chicago firm that later reduced the alewife to meal and oil on a test basis.

The use of more efficient fishing gear could never completely remove such a fish

as the alewife from Lake Michigan. Fishing with otter trawls would become unprofitable long before the population reached a very low level of abundance. Possibilities are good, however, that alewives could be cropped to a point that would make the population healthier and reduce the spring fish kill or die-off which is objectionable in many ways.

Great Lakes commercial fisheries will find it necessary to modernize operations at every level in order to cope with changing conditions. Cooperation and encouragement should come from all quarters to help the dwindling number of commercial fishermen adopt the latest technological advancements. When this is accomplished, chances are that the Great Lakes fishing industry will once again occupy a prominent place in the business community.

If the transition comes off well, with adequate consideration given to all sides of the problem, the lakes can become more valuable from both recreational and commercial standpoints. Sensible harvesting of the great numbers of underutilized fish such as the alewife should result in better environmental conditions for popular game species as well as insure that important natural food resources are not wasted.

The appearance in June 1961 of many dead fish on the beaches and adjacent waters of southern Lake Michigan is due to a natural, seasonal fish kill or die-off of alewife. Alewife is a species of herring-like fish that invaded the Great Lakes from the Atlantic Ocean by way of the St. Lawrence River. The first published record of the alewife being in Lake Michigan was reported May 5, 1949.

The U. S. Bureau of Commercial Fisheries Regional Headquarters at Ann Arbor, Mich., reports the alewife die-off is a thing to be expected. This mass mortality is not the result of commercial fishing. The die-off occurs immediately after the spawning period when these fish are in their poorest physical condition and are particularly susceptible to the effects of disease and spring-time fluctuating temperatures.



Great Lakes Fishery Investigations

LAKE MICHIGAN FISH POPULATION SURVEY CONTINUED:

M/V "Cisco" Cruise 3: The chub (*Leucichthys* sp.) population survey in Lake Michigan was continued (June 27-July 10, 1961) by the U. S. Bureau of Commercial Fisheries research vessel Cisco. Gangs of nylon gill nets (50 feet each of $1\frac{1}{4}$ - and $1\frac{1}{2}$ -, 300 feet each of 2-, $2\frac{3}{8}$ -, $2\frac{1}{2}$ -, $2\frac{3}{4}$ -, 3-, $3\frac{1}{2}$ -, and 4-inch mesh) were set at 25 and 50 fathoms off Frankfort, Charlevoix, and Manistique, Mich., and Sturgeon Bay, Wis., and at 80 and 135 fathoms off Frankfort. Chub catches were light--some very light--except at 50 fathoms off Manistique where a sizable catch was made. A very large percentage of the chubs were *L. hoyi*, except in the 80- and 135-fathom sets off Frankfort, in which *L. kiyi* made up a sizable proportion. Smelt were fairly numerous in the 25-fathom set off Manistique; otherwise the gill nets produced few fish besides chubs.

Half-hour tows with a 50-foot balloon trawl were made at 25 and 50 fathoms off Frankfort; 30 fathoms off Charlevoix; 15, 25, 40, and 50 fathoms off Manistique; and 30 and 50 fathoms off Sturgeon Bay. Chub catches were generally quite small, and were made up of 98 to 100 percent bloaters. The chubs taken in the trawls in the northern end of Lake Michigan, especially off Manistique, have averaged somewhat longer than those taken in the southern portion last year.

All 50-fathom tows contained moderate numbers of deep-water sculpins (up to 18 pounds); the 15-fathom tow off Manistique took 63 pounds of smelt and 65 pounds of alewives; and the 25-fathom tow off Manistique produced 23 pounds of smelt. There were few fish other than chubs in the other tows.

Hydrographic collections and observations were made at the following locations: 40 fathoms off Frankfort, Charlevoix, Manistique, and Sturgeon Bay; 40 fathoms in midlake between Charlevoix and Manistique; and 144 fathoms in midlake between Frankfort and Sturgeon Bay. The surface water remains rather cold for the time of year. Surface temperatures ranged from 45.1 to 62.2° F. No sharp thermocline had developed in most areas. There was generally a gradual drop in temperature from just below the surface to a depth of 100 feet or more.

Note: Also see *Commercial Fisheries Review*, Aug. 1961 p. 28.

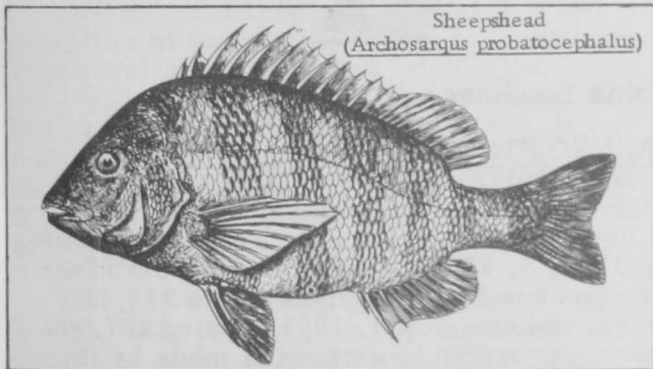
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LAKE ERIE FISH POPULATION SURVEY CONTINUED:

M/V "Musky II" June 1961: The Lake Erie investigations of the U. S. Bureau of Commercial Fisheries research vessel Musky II during June 1961 were concentrated in Sandusky Bay and the adjacent lake area. Both the 16-foot outboard Madtom and the Musky II carried on extensive trawling. Special attention was directed toward measuring the success of this year's reproduction of fish. Quarter- and half-meter plankton nets were towed to collect eggs and fry.

About mid-June, a 5-foot sled trawl was tested but it did not prove to be an effective sampling device. Toward the latter part of the month, however, the regular trawls with $\frac{1}{4}$ -inch-mesh cod ends were capturing the larger fish of the 1961 hatch. At this stage, most young could be identified without the aid of a microscope.

The preserved collections of young-of-year fish include smelt, gizzard shad, trout-perch, spot-tail shiner, sheepshead, white bass, yellow perch, and yellow pike. Samplings at present, however, are insufficient to assess the degree of success in spawning for any of the species. It appears, nevertheless, that the hatches were generally much better than those of the past year.



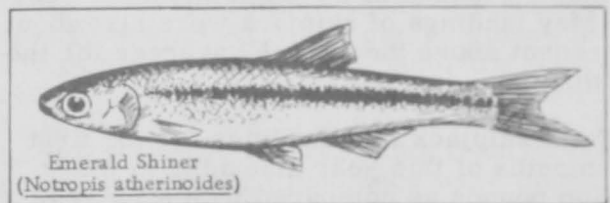
The yellow pike hatch is of particular interest. More young were taken in June than in all of last year. The greatest number collected in any one day was 19--14 were from the lake and 5 from the Bay area. Although the numbers collected are still somewhat below those for the same period in 1959, the 1961 0-group yellow pike are averaging only 1.5 inches long as compared to 3 inches for the former year. Because of this smaller size, many are believed to escape through the mesh of the trawl before they reach the cod end.



The growth of the young of all species appears to be several weeks behind that of other years. This retardation is undoubtedly due to the cooler temperatures which have prevailed throughout most of June. Water temperatures increased only 3° F.; they averaged 68° F. in the western end of the lake and 71° F. in Sandusky Bay.



Trawl catches of the larger fishes consisted mainly of yellow perch, and spot-tail and emerald shiners. The yellow perch, which had been congregated for spawning earlier this spring, have dispersed considerably to the greater depths. Many are still inshore, however, and feeding heavily on animal plankton and insect larvae. These fish are now putting on girth and weight and appear to be in very good condition.



Commercial fishermen ceased operations almost entirely and fishing will not be resumed until the fall season. Several trap nets still remain in the lake and a few seines are being hauled; their catches, however, are generally small.

Note: Also see Commercial Fisheries Review, Aug. 1961 p. 29.



Hawaii

SKIPJACK TUNA LANDINGS, JANUARY-JUNE 1961:

Landings of skipjack tuna (mostly 18-22 pound size) in Hawaii during June 1961 were about 2,750,000 pounds or only 50,000 pounds under the record for June which was established in 1954. The June 1961 landings of skipjack were caught by a fishing fleet about 25 percent smaller than in 1954. This indicates that the June 1961 landings per vessel were the highest on record.

A prediction was made in March this year by biologists of the U. S. Bureau of Commercial Fisheries that the skipjack landings in 1961 would be above average. However, the time of the annual change of surface sea temperature from cooling to warming in the vicinity of the Hawaiian Islands was such that using this as an index for predictive purposes was to extrapolate beyond the range of any of the historical data. Therefore, it was not known whether this season would be very good or whether fishing would shift beyond an optimum point and the season might actually turn out to be either poor or mediocre. Judging from the skipjack landings through June (about 5.7 million pounds), the prediction was reliable and summer conditions could be considered highly favorable for the occurrence of skipjack in Hawaiian waters.

Landings of skipjack tuna in Hawaii during May 1961 were estimated to be 1.1 million pounds or about 37 percent higher than the amount landed in the same month of 1960. The May landings of skipjack were also about 10 percent above the 1948-59 average for the month.

Total skipjack tuna landings for the first five months of this year amounted to 2.9 million pounds as compared with a 12-year average of 2.2 million pounds for the January-May period.



Industrial Products

WORLD PRODUCTION AS REPORTED BY PRINCIPAL PRODUCING COUNTRIES:

The International Association of Fish Meal Manufacturers has received and tabulated data on the production of fish meal, solubles, and oil as reported to them by 11 of the principal countries producing those products. The Association reports that on the basis of reports received from 10 of the 11 countries (Angola did not report) scheduled to report, the May 1961 production by those countries was: fish meal 193,325 short tons, solubles 10,811 tons, homogenized-condensed fish 1,353 tons, and oil 8,304,000 gallons. It is indicated that the oil data are incomplete.

The countries scheduled to report to the Association monthly are the United States, United Kingdom, Canada, Denmark, Germany, Angola, Iceland, Norway, Peru, South Africa, and France.

At the international meeting on fish meal in Rome early this year, it was agreed that it would be useful to have assembled by the Association monthly data on the production of fish meal, solubles, and oil in various countries. This is the first monthly report received by cable from the Association.



Maine Sardines

CANNED STOCKS, JULY 1, 1961:

Distributor's stocks of Maine sardines totaled 208,000 actual cases on July 1, 1961--36,000 cases more than the 172,000 cases on hand July 1, 1960. Stocks held by distributors on June 1, 1961, amounted to 215,000 cases, and on April 1, 1961, totaled 267,000 cases, according to estimates made by the U. S. Bureau of the Census.

Canners' stocks on July 1, 1961, totaled 201,000 standard cases (100 $3\frac{3}{4}$ -oz. cans), a decrease of 158,000 cases (44.0 percent) as compared with July 1, 1960. Stocks held

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, July 1, 1961, With Comparisons^{1/}

Type	Unit	1960/61 Season					1959/60 Season				
		7/1/61	6/1/61	4/1/61	1/1/61	11/1/60	7/1/60	6/1/60	4/1/60	1/1/60	11/1/59
Distributors . . .	1,000 actual cases	208	215	267	233	277	172	197	252	235	296
Canners	1,000 std. cases ^{2/}	201	294	506	1,029	1,258	359	235	397	843	1,001

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

^{2/}100 $3\frac{3}{4}$ -oz. cans equal one standard case.

by canners on June 1, 1961, totaled 294,000 cases and on April 1, 1961, amounted to 506,000 cases.

The 1961 season's pack as of July 22 amounted to only 152,000 standard cases as compared with 677,000 cases packed during the same period a year ago.

At the beginning of the 1961 packing season on April 1, the carryover was about 457,000 cases as compared to 335,000 cases a year earlier.

Note: See Commercial Fisheries Review, August 1961 p. 30.



Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, SUMMER-AUTUMN 1961:

Total United States civilian consumption of fishery products is expected to be somewhat higher in the summer-fall of 1961 than in the same period last year. But with population higher this year, per capita use of these products will remain about the same. Retail prices of fish and shellfish probably will average a bit higher this summer-fall than a year earlier.

Commercial landings of food fish and shellfish in the summer are at a seasonally high level and total catch for the year probably will be as high as in 1960. Supplies of the processed items for 1961 likely will be about the same as last year. The minor variations probably will include less canned tuna and Maine sardines, but more canned salmon.

Imports were higher for the first four months this year than a year ago and probably will continue high through the remainder of 1961, especially for fillets and shrimp. Exports of edible fishery products in the summer-fall might be considerably lower than in 1960. Due to the small catch last season and reduced domestic supplies, exports of California sardines through April 1961 were down 62 percent from the same period last year.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the Bureau of Commercial Fish-

eries, U. S. Department of the Interior, and published in the former agency's July 1961 issue of The National Food Situation (NFS-97).



Menhaden

PARASITES MAY REVEAL MIGRATORY PATTERNS:

Parasites which attach themselves to young menhaden may be used to determine where schools of adult fish originated, according to scientists at the Virginia Institute of Marine Science.

Although menhaden are spawned in ocean waters, the young come into bays and estu-



Menhaden

aries along the Atlantic and Gulf coasts where they grow to maturity.

Juvenile menhaden usually pick up parasites in the estuarine waters. The Director of the Institute reports, "The types of parasites and the numbers picked up in the Chesapeake Bay, for instance, will often be different from those picked up in the rivers and bays of Maine or Florida. By examining large numbers of small fish, we have found that the parasites found on adults correspond closely to those found on one-year-olds. We strongly suspect that these parasites will serve as natural tags in tracing their migration."

Since the incubation areas of these important commercial fish can be pinned down, it may well be possible to compare numbers of fishes originating in polluted and unpolluted areas, and also to detect changes in commercial catches resulting from increased pollution in areas which once were clean.

Menhaden provide the largest fishery in the United States. More menhaden are landed in Virginia than all the rest of its marine resources combined, and in 1959 the catch was worth over \$4,250,000 to the State's fishermen and vessel owners.

Since menhaden meal is an important ingredient in poultry feed, the fishery is of great importance to farmers. Chickens fed a small percentage of fish meal reach market size in a shorter period of time than those denied this nutritious food. Menhaden

oil is often used in paints, varnishes, and cosmetics, and large quantities are exported to Europe for the manufacture of oleomargarine.

Virginia scientists have studied menhaden from Maine to Florida and along the coast of Mexico to identify types of parasites found on them and the abundance of each kind. This has been a cooperative enterprise between the U. S. Bureau of Commercial Fisheries and the Virginia Institute of Marine Science, with the Bureau supplying samples of fish from all along the coast and the Virginia scientists collecting, identifying, and counting the parasites.

The Bureau is particularly interested in using fish parasites for natural tags to determine migration of menhaden. As natural tags, they would eliminate handling of the fish, and the percentage of returns would be much better than from man-tagged fish.

The Virginia research assistant, who has been responsible for a great deal of the Virginia laboratory's phase of this work, reports: "We have made intensive studies of menhaden collected along the Atlantic coast from New York to the tip of Florida and around the Gulf coast. There are three species found on the Atlantic coast: Brevoortia tyrannus is the important commercial species of the Chesapeake Bay; below Cape Cannel on the Florida coast, Brevoortia smithi, is the most abundant; and in the Gulf of Mexico Brevoortia patronus is the most important."

This study has been under way for two years and both Bureau and Virginia scientists feel the work accomplished is most encouraging in providing better information for the menhaden industry. Both agencies plan to increase the pace and to extend the area of this research.



Michigan

CHEMICAL CONTROL OF SEA LAMPREY IN NORTHERN STREAMS INITIATED:

Permission for the U. S. Bureau of Commercial Fisheries to continue its chemical war on the sea lamprey in 41 tributary streams in Lake Superior and northern Lakes Michigan and Huron during the July

1961-June 1962 fiscal year, has been granted by the Michigan Conservation Department.

All but seven of the streams flow into Lakes Huron and Michigan where the Bureau has shifted its offensive since last fall after completing the first series of treatment in Lake Superior streams.

The Bureau is currently working on blocks of northern Lake Michigan streams in Menominee, Delta, Schoolcraft, Mackinac, and Chippewa counties where it hopes to complete its first punch this summer. Plans call for linking its efforts closely with the Fisheries Research Board of Canada during the present fiscal year's campaign in Lake Huron streams.

The Bureau's Great Lakes Laboratory Director estimates it will take about 4 years to complete the first round of treatment in all lamprey-producing streams tributary to Lakes Michigan and Huron.

Hopes of breathing new life into the lake trout fishery of the Great Lakes are pinned to the lamprey control program. The next step, already started on a limited scale, is that of restocking the upper Great Lakes with yearling lake trout.

Heading up this immense control-restocking effort is the Great Lakes Fishery Commission which is made up of conservation officials from Ontario, the Federal government, and the Great Lakes States.



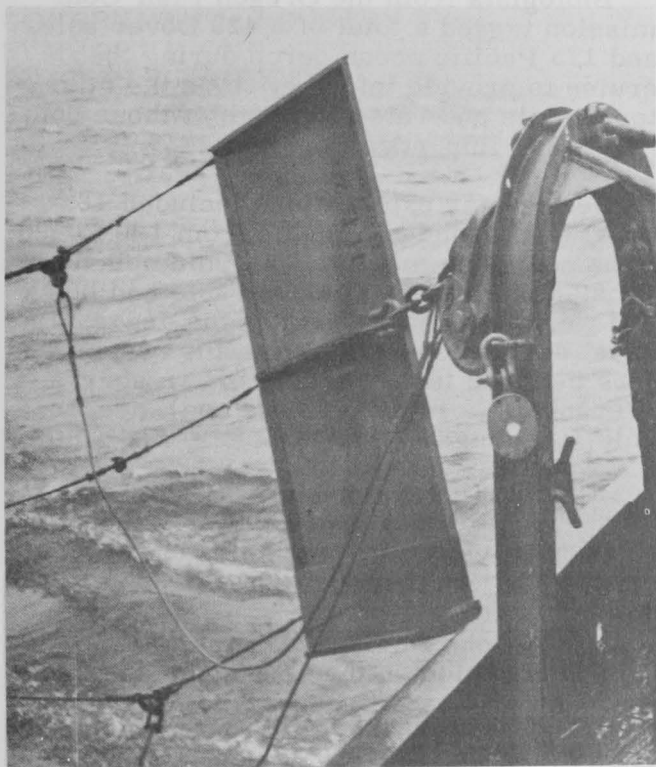
North Atlantic Fisheries Exploration and Gear Research

SURVEY OF MIDWATER FISHERY RESOURCES OFF NEW ENGLAND CONTINUED:

M/V "Delaware" Cruise 11: Over 1,000 linear miles of Gulf of Maine and Georges Bank waters were surveyed for concentrations of midwater fishes by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware during a July 6-14, 1961, cruise. Utilizing fish-finding equipment, extensive portions of the Maine and Massachusetts coastal areas and parts of Georges Bank were examined to determine the availability of commercially-important

species. No midwater catches in commercial quantities were made during the cruise.

A midwater trawl was used on 10 occasions to sample indications of marine life revealed by the fish-locating equipment. These fish species were represented in the catches: spiny dogfish, Squalus acanthias; Atlantic herring, Clupea harengus harengus; silver hake, Merluccius bilinearis; lumpfish, Cyclopterus lumpus; longhorn sculpin, Myoxocephalus octodecemspinosus; butterflyfish, Poronotus triacanthus; Atlantic mackerel, Scomber scombrus; and alewife, Alosa pseudoharengus.



Hydrofoil otter board used to spread midwater trawl aboard M/V Delaware. These boards are fished in a vertical position and allow excellent control over the depth of the trawl, as indicated by a depth-sounder transducer mounted on the net.

Depth control of the midwater gear was accomplished by varying the vessel speed and the length of the towing warp. The response by the hydrofoil otter boards used to spread the net allowed fairly rapid changes in the depth of the net amounting to 10 fathoms or more.

In addition to the midwater sampling carried on, experiments using mercury-

vapor lamps for fish attraction were attempted at several locations; dip and gill nets were used to sample those fish attracted. Included in catches by these methods were hake (Urophycis sp.), Atlantic herring (Clupea harengus), sand eels (Ammodytes americanus), alewife (Alosa pseudoharengus), and Atlantic mackerel (Scomber scombrus).

Note: Also see Commercial Fisheries Review, Aug. 1961 p. 32 and April 1961 p. 26.



North Atlantic Fisheries Investigations

BOTTOM SEDIMENTS AND ORGANISMS COLLECTED FROM GULF OF MAINE:

M/V "Delaware" Cruises 61-9 and 61-10: Three-hundred-sixty samples of bottom sediments and organisms associated with the bottom were collected at regularly-spaced stations at 3-mile intervals on 8 east-west transects across the Gulf of Maine by the U. S. Bureau of Commercial Fisheries research vessel Delaware during two cruises that ended late in June 1961.

The samples will be analyzed in the Bureau's Woods Hole, Mass., Laboratory to determine the relation of the bottom organisms to the abundance and distribution of bottom-living fishes which subsist on animal life. Further studies will be made of the relation of bottom organisms to the sediment types in the Gulf of Maine and to the oceanographic conditions obtaining in the various parts of the Gulf.

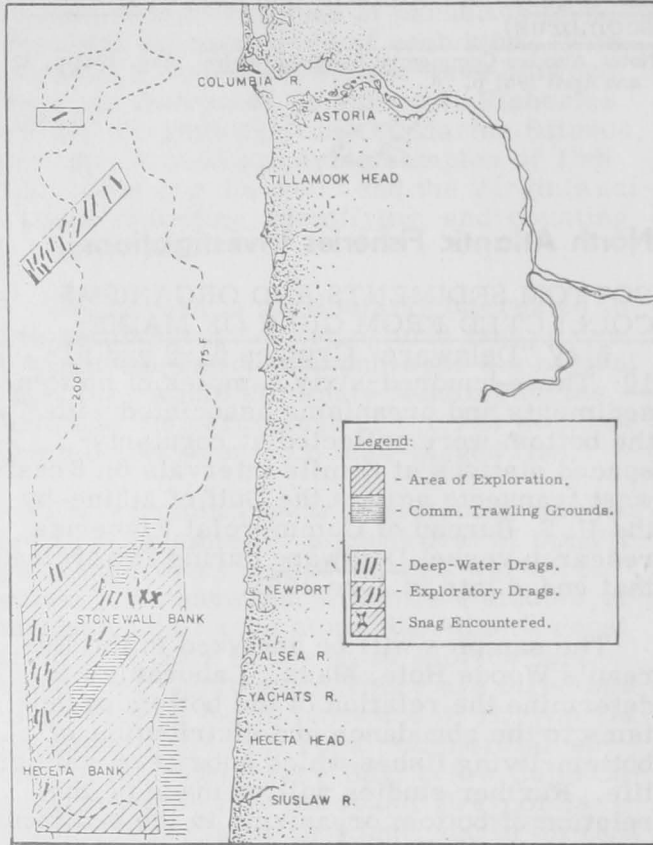


North Pacific Exploratory Fishery Program

AREA OFF COAST OF OREGON SURVEYED FOR TRAWLABLE BOTTOM AND DEEP-WATER FAUNA:

M/V "John N. Cobb" Cruise 50: Objectives of an 8-week cruise (ended June 15) by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb were (1) to locate trawlable bottom in areas presently avoided by commercial trawlers, (2) to tag bottomfish found to inhabit such areas, and (3) to obtain information on marine fauna inhabiting very deep

waters off the Oregon coast. The deep-water explorations marked the start of a survey to be conducted off Oregon and Washington by the Bureau in conjunction with the U. S. Atomic Energy Commission. The Oregon Fish Commission cooperated with the Bureau in the cruise.



M/V "John N. Cobb" Cruise 50.

Regions included in the survey extended from Stonewall Bank off Newport, Ore., to the southern edge of Heceta Bank and an area located southwest of the mouth of the Columbia River.

Systematic surveys of the ocean bottom with a high-resolution, low-frequency echosounder resulted in the discovery of several trawlable areas of soft bottom within rocky regions avoided by commercial fishermen. The trawlable bottom included (1) a relatively large area of approximately 100 square miles at depths ranging from 75 to 200 fathoms located true west of Stonewall Bank, (2) a small area extending from about 90 to 200 fathoms located offshore between the Yachats River and the Siuslaw River, and (3) an area of about 20 square miles located at depths between 58 and 66 fathoms about

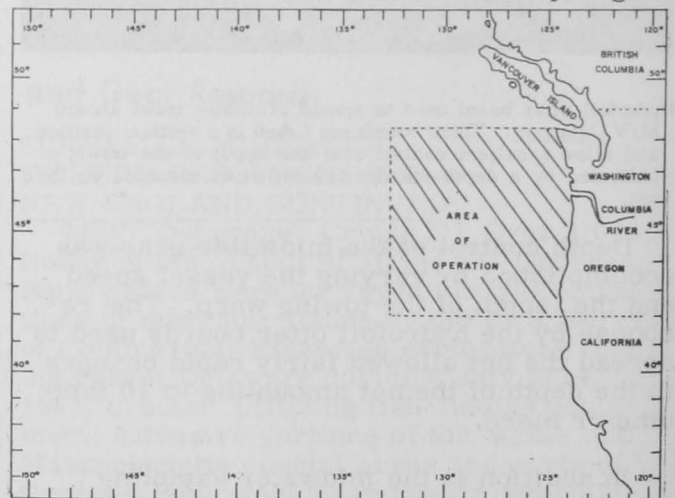
20 miles off Heceta Head. Good catches of Dover sole, blackcod, and red rockfish were taken in the first area. The second area yielded excellent catches of Pacific ocean perch, red rockfish, Dover sole, and blackcod, including the largest catch ever made by the John N. Cobb--40,000 pounds of Pacific ocean perch obtained in 20 minutes of trawling. The grounds in the third area off Heceta Head produced poor catches of bottomfish with some damage to fishing gear resulting from the presence of large boulders. Damage to fishing gear also occurred in the first two areas from scattered outcroppings of coral.

Biologists from the Oregon Fish Commission tagged a total of 5,429 Dover sole, and 175 Pacific ocean perch during the cruise to provide information on the migratory habits and rate of growth of those commercially-important species.

Deep-water explorations included 16 trawl drags made at depths from 100 to 425 fathoms off the mouth of the Columbia River. Substantial catches of Dover sole and blackcod were taken in several of the drags. Unusual species encountered in the deeper waters included tanner crabs, brown sharks, grenadiers (a relative of the cod), deep-sea sole, and fanged viperfish.

COASTAL WATERS OFF OREGON AND WASHINGTON EXPLORED FOR ALBACORE TUNA:

M/V "John N. Cobb" Cruise 51: To obtain information on the abundance and distribution of albacore tuna and other pelagic



M/V "John N. Cobb" Cruise 51 (July-August 1961).

species of fish, the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb departed Seattle on July 10, 1961, for a trip of 6 weeks of exploratory high seas fishing off Washington and Oregon. The coastal waters to 300 miles offshore of the two states are scheduled to be explored with gill nets, midwater trawls, and trolling. Information on albacore catches was scheduled to be broadcast to the fishing fleet by radio from the John N. Cobb.



Oceanography

GOVERNMENT-INDUSTRY SYMPOSIUM ON INSTRUMENTATION HELD IN WASHINGTON:

A Government-Industry Symposium on Oceanographic Instrumentation was held in the Department of the Interior Auditorium by the Interagency Committee on Oceanography on August 16-17, 1961.

One of the most serious problem areas in the National Oceanographic Program is that of instrumentation. Existing methods of data collection and processing must be radically improved. Consequently, the primary objective of the symposium is to focus attention in this critical area and to make known to representatives of United States industry the oceanographic instrumentation requirements which confront the Nation and which must be solved if the national objectives in the field of oceanography are to be fulfilled. The symposium was open to all companies interested in oceanographic instrumentation and data handling.

The instrumentation discussed during this symposium was unclassified and reflected the requirements of Federal and non-Federal activities and both military and nonmilitary applications. It included basic and applied research aspects as well as ocean surveys and will apply to under way and stopped shipborne operations and to individual instruments and instrument systems. The subject matter involved the following disciplines: physical and chemical oceanography, marine geology, geomagnetics, gravity, bathymetry, marine biology, radiobiology, meteorology, special fisheries investigations, and others.

The Interagency Committee on Oceanography is the organization established by the Federal Council for Science and Technology to coordinate the United States National Oceanographic Program currently being carried out by Federal agencies having an interest in oceanography. This Interagency Committee represents the Departments of Defense; Commerce; Interior, Health, Education and Welfare; State; Treasury; the Atomic Energy Commission; and the National Science Foundation.



Oregon

ALBACORE TUNA SCOUTING CRUISE ENDS SUCCESSFULLY:

A successful exploratory albacore tuna cruise by the Oregon Fish Commission's

chartered vessel Minnie B was completed on July 16. A Fish Commission biologist reported the best catches of albacore tuna were made from Cape Blanco north to Coos Bay, Ore., about 75 miles offshore, in waters with a 62° F. surface temperature.

The 15 albacore that were tagged and released were caught by trolling a commercial-type feathered jig. The surface water temperatures encountered during the cruise were between 62° and 64° F., generally high for this time of year and up to two degrees higher than during a similar 1960 cruise.

The biologist also reported that although no commercial tuna vessels were sighted on the albacore grounds during the cruise, some boats were leaving Astoria and Newport on July 15 and 16. One boat out of Astoria reported a catch of three tuna made on July 15 about 40 miles southwest of the Columbia River mouth.

The July cruise marked the third consecutive year the Fish Commission has undertaken surveys to help predict the presence of albacore tuna off the Oregon Coast by correlating biological and environmental conditions to the presence or absence of tuna, and to gather data by tagging methods on the migration and distribution habits of the tuna.

* * * * *

FISH COMMISSION OBSERVER REPORTS NO FISH KILLS IN OFFSHORE SEISMIC OPERATION:

No fish kills were observed during the initial oil exploration operations off the Oregon coast, the Fish Commission of Oregon observer aboard the Shell Oil Company's seismic vessel Miss Betty reported late in June 1961. The observer, assigned jointly by the Fish Commission and the Oregon Game Commission to observe all seismic oil exploratory work being conducted off the Oregon coast by Shell Oil Company, was accompanied on the first cruise on June 21 by two fishery agents of the Oregon Game Commission.

Originally planned as a three-day cruise, the operation was limited to one day because of damage sustained by the Miss Betty in heavy seas as the vessel was heading north from California to begin work off Oregon.

Working out of Coos Bay, two Shell Oil vessels were involved in the first

cruise--the Miss Betty handling the explosive charges and the Miss Juanita carrying seismic instruments.

The observers stated that each shot site was observed but no dead fish were sighted. The absence of concentrations of sea birds that would normally soon assemble over any fish kill gave additional evidence that the explosions had not had adverse effects on fish that may have been in the area.

Electronic devices capable of detecting the presence of schools of fish are operated on the explosives vessel as a precaution against detonating a charge in close proximity to fish concentrations where considerable damage could conceivably result.

Every precaution to assure the safeguarding of the State's offshore fishery is being taken, the Commission Director stated. The assignment of a full-time observer by the Commission during all seismic operations is an additional precaution to assure that potential fishery damage is prevented. The observer, acting on and in behalf of the State Fish Commission and the State Game Commission, has the authority to stop operations in any given area if, in his opinion, undue damage to marine life or wildlife will occur, or has occurred, or to stop temporarily or slow up operations until the observer can clearly determine the amount of actual or potential biological damage.

* * * * *

McKENZIE RIVER SALMON SPAWNING CHANNEL AGREEMENT REACHED:

Regarding the operation and evaluation of an artificial spawning channel for spring chinook salmon on the McKenzie River, the Oregon Fish Commission and the Eugene Water and Electric Board have entered into a formal agreement, the Commission Director announced late in June 1961. The spawning channel was designed to offset some of the losses of natural spawning grounds occasioned by the construction of the Eugene Board's Carmen-Smith hydroelectric project on the McKenzie about 70 miles above Eugene. The installation is the first of its kind in Oregon for spring chinook salmon. Although the McKenzie River and its tributaries produce between 45 and 50 percent of the Willamette River system's highly important spring chinook run, no fish passage facilities have been provided at Carmen-Smith due to

its location above the major spawning area of the McKenzie system with, consequently, relatively few anadromous fish involved.

The artificial spawning facility's design was determined by attempting to duplicate optimum natural spawning conditions. It consists of a channel 500 feet long by 30 feet wide (the channel bottom of which is covered with graded gravel), a holding pond for adult salmon, a controlled-flow water supply, trap and weirs, and a main stream velocity barrier to divert the fish into the facility. One hundred or more spring chinook females can be accommodated by the present channel, Schoning stated.

A Commission biologist has been assigned to conduct the operation of the channel and to evaluate the results of the experiment. Similar operations, notably in British Columbia and in California, have given indications that the spawning channel may become an important tool in management of anadromous fish runs in Western rivers, where an ever-increasing number of dams create barriers to free passage of anadromous species.

The Eugene Water and Electric Board is financing the study, initially scheduled for a period of three years.



Oysters

LONG ISLAND SOUND OBSERVATIONS ON SPAWNING AND SETTING:

Systematic observations in Long Island Sound on spawning and setting of oysters and starfish, using the same 10 major stations as in previous years were planned for this summer by the Milford, Conn., Biological Laboratory of the U. S. Bureau of Commercial Fisheries. However, several others were to be established, chiefly in connection with studies on chemical methods of control of shellfish predators.

In addition to information on setting, the Laboratory plans to report on all other important biological phenomena that may be observed. Industry and shellfish biologists, as in the past, were to be informed of progress in the development of methods of chemical control of shellfish enemies.

Spawning of oysters as of July 7, 1961, had begun in the shallow tributaries of Long

Island Sound, but the predominating majority as of that date were still unspawned and many unripe. Setting of starfish had also begun. (Bulletin No. 1, July 7, 1961.)

* * * * *

LONG ISLAND SOUND OBSERVATIONS ON SPAWNING AND SETTING AS OF JULY 26:

Several stations, in addition to the basic ten, were established in New Haven Harbor for observations on spawning and setting of oysters and starfish during the summer by the Milford, Conn., Biological Laboratory of the U. S. Bureau of Commercial Fisheries. These stations were to be used in connection with studies of chemical methods of controlling shellfish enemies.

Later, it became necessary to establish several other stations--another in New Haven Harbor and 3 in the Bridgeport area. The last three, established upon the request of the State Shell Fish Commission, were located in the area where the Bridgeport Harbor channel is to be dredged. These stations were to be used in connection with observations on turbidity and sedimentation created, by dredging, upon larval, juvenile, and adult mollusks.

The water temperature at all of the stations showed a considerable increase, and on July 24, when the last series of spat collectors was brought in, the temperature ranged from approximately 65°-73° F.

Studies of oysters showed that the majority of them were in a partially spawned condition, as was to be expected during this part of the reproductive season. Some, however, were virtually spawned out, while another small group was composed of individuals that were not quite ripe.

Studies of plankton samples were carried on as a matter of routine to determine whether larvae of oysters and other bivalves were present in the water. Early in July bivalve larvae, especially young ones, were numerous. By July 10 there were almost no early stage larvae at any of the stations, but a fair number of late stage larvae, although none of oysters, were found. By July 13 these larvae had almost completely disappeared in the Milford and New Haven areas, while at Bridgeport a fair number of mussel larvae was still found.

Plankton samples collected two days previously again showed a scarcity of bivalve larvae at all stations. This phenomenon was ascribed to a heavy bloom of dinoflagellates (microscopic forms causing "red water"), primarily Prorocentrum micans, and a species of Gymnodinium, waste products of which probably affect molluscan larvae in nature and also render sea water temporarily unfit for the laboratory work on fertilization of oyster and clam eggs and growing of larvae. These conditions, however, improve later in the season.

Setting of starfish continued and occurred at all of the basic 10 stations, except at one station. One station located at a depth of 24 feet in the Bridgeport area showed the heaviest set.

The first oyster spat was found at a station in New Haven Harbor in an area where studies of the methods of controlling oyster enemies were being conducted. It set on July 21. This observation indicates that the Laboratory's formula offered many years ago stating that, "The beginning of oyster setting in Long Island Sound should be usually expected on July 19 ± 4 days, regardless of lunar phases and of changes in hydrostatic pressure caused by changes in tidal level," still holds true in the majority of cases. (Bulletin No. 2, July 26, 1961.)



Pollution

CONTRACT AWARDED FOR DAM TO STOP POLLUTION IN UPPER SACRAMENTO RIVER VALLEY:

A long-standing water pollution problem which has taken a heavy toll of salmon, steelhead trout, and rainbow trout in the upper Sacramento River Valley is being corrected, the Under Secretary of the Interior announced on June 30, 1961. The problem originates with drainage water principally from abandoned mines in the Spring Creek area above Redding, Calif., bringing metal and acid pollutants into Keswick Reservoir and the Sacramento River.

The solution proposed by the Department of the Interior is a 190-foot-high earthfill dam, now under contract for

\$3,196,387, which will permit water regulation to dilute the pollutants, and which at the same time will prevent debris from obstructing the tailrace of the Spring Creek Power Plant, which is now under construction. Both are being built by the Department's Bureau of Reclamation as part of the Central Valley Project.

According to the Commissioner of Fish and Wildlife, studies made by the U. S. Fish and Wildlife Service show that the fall run of chinook salmon in the Sacramento River about the mouth of the Feather River provide an annual catch of 700,000 fish, worth about \$5,900,000 to commercial and sport fishermen. About one-fourth of this fishery, with an annual value of \$1,400,000, comes from the four-mile stretch of the river adversely affected by the pollutants.

Historically, high Spring Creek flows frequently coincided with flood flows of the Sacramento River and the toxic water was diluted sufficiently to be tolerable to fish, primarily salmon. However, since flood control on the upper Sacramento was achieved by the construction of the Shasta Dam, the highly polluted Spring Creek flows have entered the Sacramento River at controlled flow periods. As a result, the waters below Keswick Dam, where the migrating fish are concentrated, have been toxic enough at times to kill large numbers of salmon and steelhead.

The Service studies also showed that not only did the mine-waste pollution kill salmon and damage their food supply but that it also ruined an important rainbow trout fishery in the Spring Creek area of the Keswick Reservoir.

Facing the dual problem of pollutants seriously damaging the important fishery and silt and debris threatening the tailrace of the new Spring Creek powerplant, the Bureau of Reclamation designed the Spring Creek debris dam to provide storage space for 2,000 acre-feet of sediment each year for the next 50 years. In addition the dam will provide for the retention of the polluted water so that it can be slowly released and diluted to provide protection to the fish and the organisms upon which they feed.

The Spring Creek Dam embankment will be 1,200 feet long at the crest. The contract includes construction of the dam, concrete

spillway and outlet works, and excavation of the powerplant tailrace. The powerplant tailrace must be complete for use by June 1, 1963, when the first generator of the 150,000-kw. Spring Creek Powerplant will be tested, prior to going into operation about July 1, 1963. The powerplant is six miles northwest of Redding and the debris dam will be a short distance upstream. The powerplant and dam are part of the Trinity River Division of the Central Valley Project.

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INDUSTRIAL WASTES ACCOUNT FOR MOST FISH KILLS:

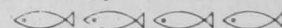
More fish are reported killed by industrial wastes than by other pollutants, according to a report of the U. S. Public Health Service's Division of Water Supply and Pollution Control. Figures contained in the first annual summary report of the cooperative Federal-State fish-kill project showed that in the first seven months, June through December 1960, a total of 286 reports was received from 36 states showing a total of 6.3 million fish killed.

Agricultural poisons accounted for the second highest number of fish-kill reports, though they were in fifth place in total number of fish killed.

The total river mileage affected was 1,153 miles, in addition to 51 miles of lake and bay shore lines, and 1,407 acres of lakes, reservoirs, and bays.

Of the 305 reports on source of kills (many reported more than one source), industrial wastes were reported in 98 instances, with a total of 5,460,000 fish killed; agricultural poisons were reported in 81 instances, with a total of 73,000 fish killed; unknown sources were reported 51 times with a total of 190,000 fish killed; "other" sources were listed in 38 reports with a total of 38,000 fish killed; domestic sewage was fifth with 27 reports, with 287,000 fish killed; and mining operations were reported 10 times with a total of 250,000 fish killed.

One kill traced to industrial wastes was estimated at 5 million fish. This was in 19 miles of the Kanawha River for about two days late in August 1960, caused by a spill of methyl alcohol. Even after subtracting this figure, the number of fish killed by industrial wastes is nearly double the next named source of total number of fish kills, domestic wastes.



Russian Gill-Netter Docks in Boston, Mass.

As a result of a medical emergency on board the Soviet fishing vessel Kanhnhlpaa (CPT 184), it docked in Boston harbor during June 1961. The vessel, a gill netter, was one of a fleet of vessels which had been working in the western North Atlantic between the Grand Banks of Newfoundland and Georges

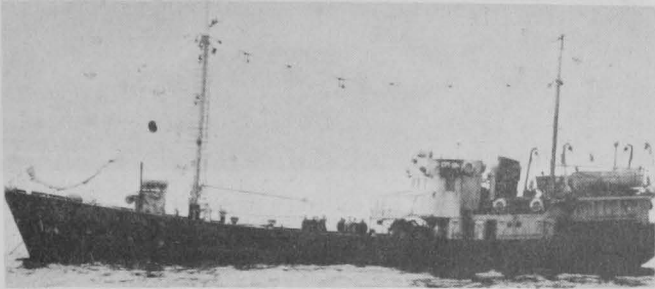


Fig. 1 - The Kanhnhlpaa, a combination-type vessel, approximately 145 feet long. This type of vessel is normally active in the herring fishery off Northern Europe and is capable of drift gill-net fishing and/or trawling. Other than a trawling winch, there was no trawl gear aboard the vessel during its visit to Boston. The vessel ordinarily fishes with a mothership. The vessel salts its catch in barrels, which are later transferred to a mothership. There is adequate fuel aboard for a trip of about 30 days.

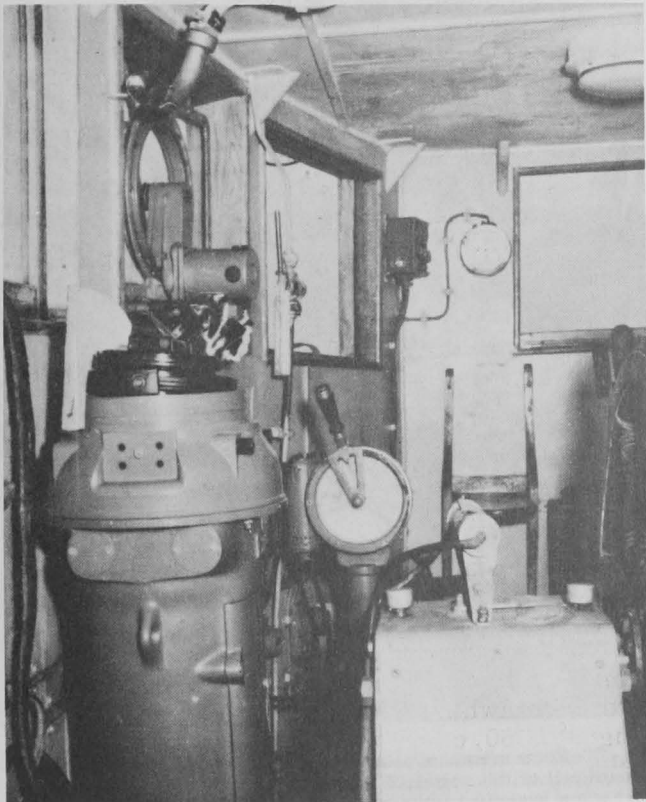


Fig. 2 - View of the pilothouse aboard the Soviet gill-netter.

Bank off the Massachusetts coast. With the permission of the Soviet Embassy, several members of the U. S. Bureau of Commercial Fisheries Gloucester Exploratory Fishing and Gear Research Base were permitted on board to see the vessel and its gear.

The Kanhnhlpaa had been away from her home port of Kaliningrad on the Baltic Sea since early April of this year; however, the vessel's officers expected that they would return to European waters soon after their departure from Boston.

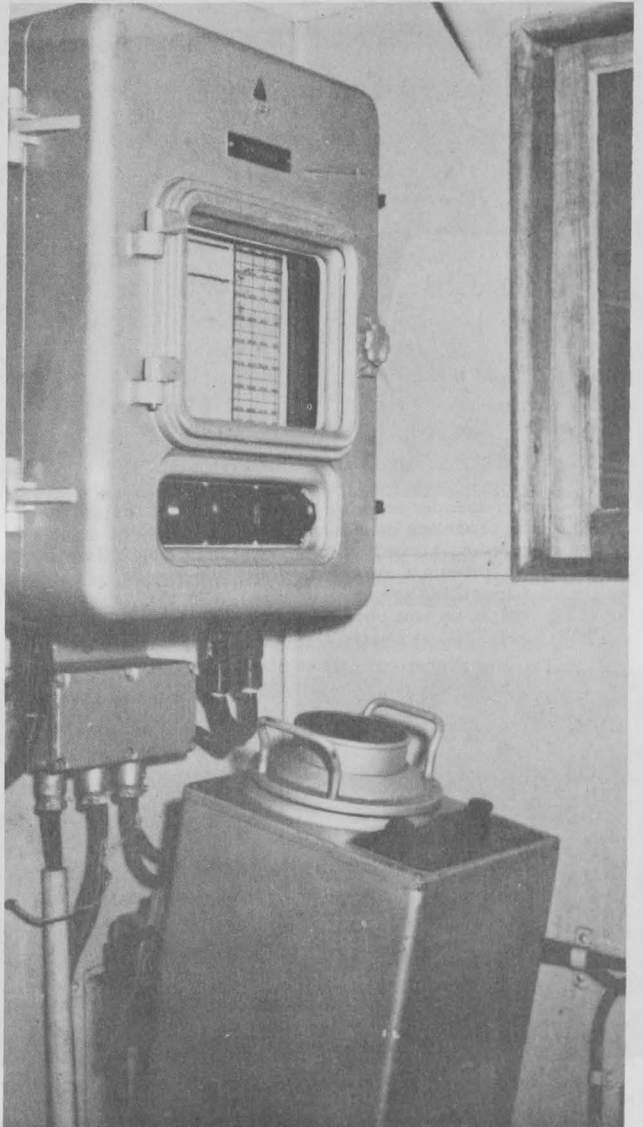


Fig. 3 - Depth-sounding equipment mounted in the pilothouse: note the "fishscope" under the recorder.



Fig. 4 - Depth-sounder recording being examined aboard the gill-netter. The recording gear is utilized principally as an orientation instrument, according to a vessel officer. Although occasional fish traces are apparent, the depth-sounder is not ordinarily used specifically for fish-finding. No other type of fish-locating equipment was observed.



Fig. 5 - Portion of gill net piled under tarpaulin on port side of fore-deck. Nets observed were of a nylon-type synthetic. Mesh sizes in use varied from 24 to 32 mm., or 0.9-1.3 inches (bar measurement). When fishing, 50 to 70 joined sections of net are set out from the port side. These sets are made in a straight line and when completed cover up to 3 km. (approximately 2 miles).



Fig. 6 - Footrope of gill net coiled on starboard side of vessel. The heavy footrope provides the weight to sink the nets. It is suspended from the gill net by rings similar to those on a purse seine.

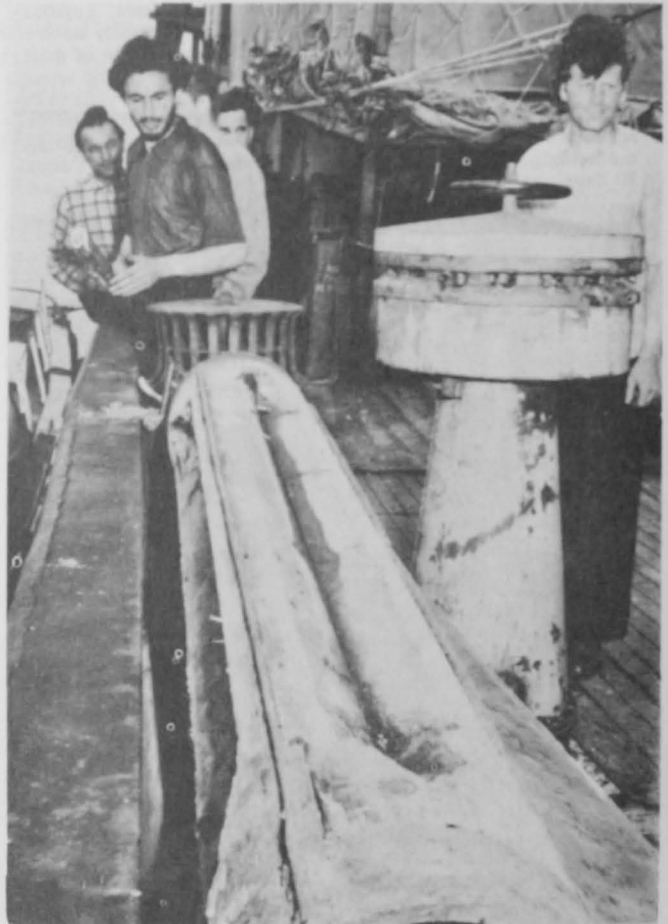


Fig. 7 - Crew members near the roller and net hauler on the starboard rail of the vessel. There were 23 in the crew of the vessel when it arrived in Boston.



Fig. 8 - Fairlead and capstan used to haul the footrope aboard. This gear is mounted near the vessel's bow on the starboard side.



Fig. 9 - Close-up of net-hauling device in use aboard the Kanhn-hlpa. This equipment is generally similar to hauling devices used by gill-net fishermen in New England, although it is of heavier construction.



Fig. 10 - Visitors with crew members (in background) examining a float from which the gill nets are suspended. The corkline of the nets is usually fishes from $\frac{1}{2}$ to 5 fathoms below the surface.

--By Warren F. Rathjen and Peter C. Wilson,
Fishery Methods and Equipment Specialists,
Branch of Exploratory Fishing and Gear Research,
U. S. Bureau of Commercial Fisheries,
Gloucester, Mass.

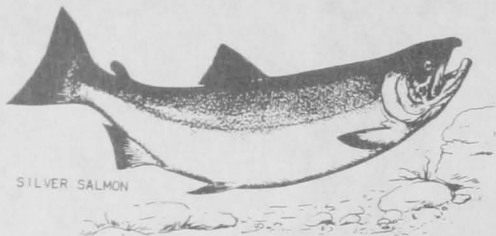


Salmon

MORTALITY STUDIES OF SILVER SALMON HOOKED AND RELEASED BY TROLLERS:

Determination of the mortality of silver salmon hooked, landed, and released during normal commercial trolling activities in Oregon offshore waters was the primary objective of a recently completed 18-day salmon troll cruise by Oregon Fish Commission biologists aboard the chartered vessel Barracuda, the Commission announced on June 30.

The question of hooking mortality is of primary concern in the management of the State's salmon resource since, during actual commercial trolling operations, minimum-size requirements and a difference in open-fishing season periods on chinook and silver salmon result in the release of many salmon hooked and boated on the offshore trolling grounds.



Present regulations specify that commercially-taken chinook must measure at least 26 inches in length. Although there is no minimum-size requirement on silver salmon, the season on this species does not open until June 15, two months after the chinook season opens. The difference in season is based upon the biology of the silver which shows phenomenal growth during the final year of its two-year ocean sojourn, making the delayed opening economically sound as well as representing good management of the resource.

More than 1,200 salmon, predominantly silvers, were tagged and released during the 12 full days and 2 partial days of actual fishing time during the cruise. Regulation commercial gear, including various types of spoons and wobblers equipped with the usual barbed hooks, was used during the scientific investigation. An area 20 miles in length between the mouth of the Columbia River southward to the vicinity of Cannon Beach was fished.

In addition to the observed mortality experienced while actually hooking and boating the salmon during the initial phases of the operation, returns of tagged fish from both the commercial and sports catch will yield information on delayed mortality from injuries not readily apparent at the time of tagging and release. As a bonus, the fisheries specialists expect to gain more information concerning fishing intensities on silver and chinook salmon stocks as well as gathering supplemental biological data on migratory habits and distribution. Such information is vital in determining proper open and closed seasons and size limitations

in keeping with the best possible management of this important resource.

Both commercial and sports fishermen are urged to report the taking of tagged salmon to the Fish Commission Research Laboratory, Astoria, or to the Fish Commission of Oregon, Portland 1, Oregon.



Sea Scallops

ECONOMIC STUDY OF ATLANTIC COAST FISHING INDUSTRY STARTED:

A comprehensive economic study of domestic sea scallop production has been started by the U. S. Bureau of Commercial Fisheries, it was announced on June 27, 1961. The objectives of the study are to examine economic trends in the New England sea scallop fishing industry and to determine the competitive position of the domestic fleet in relation to foreign-based vessels.



Typical scalloper operating out of New Bedford, Mass.

In the decade 1951-1960, sea scallop imports have risen from about 750,000 pounds annually to 6,800,000 pounds. Canada exported about 6.3 million pounds to the United States in 1960 as compared to United States production of 26.6 million pounds. The share of the domestic market supplied by foreign shippers has been steadily rising in recent years.

The reason for the study is the economic distress in which the sea scallop fishing industry centered at New Bedford, Mass., now finds itself. Prices for sea scallops at that port have declined drastically and fishermen's earnings have been severely affected.

The study is being made by Boston College under a \$16,750 contract awarded by the U.S.

Bureau of Commercial Fisheries. It will be financed with funds made available by the Saltonstall-Kennedy Act of 1956, which has as its objective the betterment of the domestic fisheries. The study is to be completed by June 30, 1962.



Shrimp

FREEZE-DRIED PRODUCT ON THE MARKET FOR INSTITUTIONAL USE:

Now freeze-drying, a new preservation process, is being used to preserve shrimp. Freeze-dried shrimp sell for about the same price as green frozen shrimp.

This new product is being produced by a large United States importing firm through a food processing subsidiary at San Carlos, Tex.

Shrimp, frozen or fresh, are cooked and cleaned, quick frozen, and dehydrated at such high vacuum that ice crystals do not melt to deform the tissues, nor does surface-skinning occur. The freeze-dehydrated shrimp after rehydration return to a fresh-like state.

They are shipped in 3-quart cans, evacuated, and refilled with an inert gas. They can be transported and stored without further refrigeration until ready to serve. Once packed in the can, shrimp need no refrigeration until the container is opened. Then to reconstitute the shrimp, they are placed in lukewarm water for 15 minutes, which restores them to their original appearance and freshness. The 3-quart can yields 3½ pounds of shrimp with all its natural appearance, flavor, and texture restored.

At present only institutional users are being served from the San Carlos plant which handles several tons a day.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, APRIL-JUNE 1961:

The following is a report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for April-June 1961.

Oyster Studies: As a cooperative program, the Laboratories and the State's Division of Commercial Fisheries set aside seed oyster beds in the spring and early summer of 1960. From these seed beds commercial oystermen harvested and transplanted 3,168 bushels of young oysters to other leased grounds within the State. This operation was successful. During the period covered by this report such transplantings were expanded and this time 36,562 bushels of seed were distributed on leased grounds. Detailed inspections of some of the plantings indicate that less than a 10-percent mortality took place. In general this program, which in the past years has not been followed in South Carolina, appears practical, provided the seed are moved to areas comparable in hydrographic conditions.

Personnel from the Laboratories also assisted in establishing and cultivating oyster parks where the general public can gather oysters for private use. Two dozen of these public areas have now been set up; some in each of the coastal counties.

Also during the quarter, tests were run on the value of a lightweight aggregate to determine if it could be used as a substitute for shell cultch. Paired wire bags of shell and rock were exposed in a good setting area. Setting began during the fourth week of May. By the first week in June setting on steamed shell cultch had reached an intensity of 15 to 16 spat per square inch. On the rock aggregate, setting was extremely light. However, by late June setting on the substitute cultch began to improve. The tests will be continued through July before appraisal of the substitute cultch is made.

An examination of seed oysters moved in October 1959 from a high salinity, intertidal area to a low salinity, deep-water area showed that most of the few oysters now there are from a natural set. None was found over 2 inches from hinge to bill and more than 50 percent of those gathered were less than 1 inch. On February 10, 1960, four covered wire trays containing high-salinity intertidal seed were placed on the deep-water beds. Three of the four trays were silted over when recovered on June 28, 1961. The fourth tray contained a dozen live oysters: five in the 1 to 2 inch class; 6 in the 2 to 4 inch group; and 1 was 3½ inches. All were in poor condition and showed no new growth.

This experimental planting confirms the belief that very careful attention must be

paid to transplanting of oysters in South Carolina waters, particularly to environmental conditions. Transplanting to subtidal beds certainly needs further study.

Shrimp Studies: Both white and brown shrimp declined in abundance in experimental trawls during the second quarter of 1961. Brown shrimp were about 5 times less numerous, and white shrimp showed a drop of over $2\frac{1}{2}$ times during the quarter as compared with the same quarter of 1960. The decrease in numbers of white shrimp to date, however, is by no means an indication of a poor fall season since spawning is still continuing.

Postlarval brown shrimp were scarce in experimental plankton tows this year. Although these postlarval shrimp continued to recruit for a longer period this year, their numbers did not approach those of 1960. White shrimp postlarvae began to appear in plankton tows in late May and continued to increase in abundance throughout June. These postlarvae should reach maximum abundance in inshore waters during the first few weeks of the third quarter of 1961. Then it should be possible to make some predictions as to the expected abundance of adult shrimp for the fall of 1961.

Fish: Shrimp survey catch data for the April-June quarter this year revealed that small spot were seven times as abundant in experimental trawl hauls as compared with those made during the same period in 1960. These findings lend support to the earlier predictions that 1961 should be a very successful year for this species.

The number of croakers have increased somewhat since the early part of this year, but still continue to be considerably less abundant than they were at this time in 1960. The decline amounts to about 30 percent.

Pond Cultivation: Three experimental shrimp ponds were drained and harvested during the quarter. Two of these were one-acre ponds and the other was a small one-tenth acre pond which had been stocked by means of a 4-inch fish pump. The one-acre ponds had been drained on December 16, 1960, screened off with one-quarter inch wire mesh and treated with "Chem-Fish" to kill the remaining fish. These ponds were then allowed to stock naturally by flooding from the nearby creek.

The harvest from the one-tenth acre pond was very small. Only six brown shrimp were collected. This experiment was not considered to be a valid test of the effectiveness of the fish pump in stocking shrimp ponds since postlarval brown shrimp were very scarce this year. The experiment will be repeated during the time that white shrimp postlarvae are abundant.

One of the one-acre ponds which had very little interchange of water with the creek, contained only $2\frac{1}{2}$ pounds of 31-35 count brown shrimp, 52 pounds of fish (chiefly spot), and 11 pounds of blue crabs.

The other acre pond, which had been allowed to flood and partially drain on every tide from early March until May, contained a considerably greater amount of shrimp and fish. This pond yielded approximately 9 pounds of brown shrimp, 150 pounds of fish, and 7 pounds of blue crabs. The majority of the fish were small spot which had entered the pond as larvae earlier in the year. The total number of fish collected from the pond was about 15,000; of which 13,000 were spot.

Installation of an eight inch irrigation pump, to be used in pond stocking of postlarval shrimp, got under way during the quarter. This pump will move large volumes of water from the creek which runs near the Laboratories into a one-acre experimental shrimp pond. This experiment is to determine if postlarval shrimp can be pumped into a pond in sufficient quantities to give an adequate yield. This will give actual experimental data to answer the numerous letters of request on shrimp farming from those areas which, unlike South Carolina, do not have sufficient rise and fall of tide to stock the ponds.

Note: See Commercial Fisheries Review, June 1961 p. 39.



Tuna

RESEARCH DISCUSSED AT HONOLULU MEETING:

An informal Pacific Tuna Biology Conference was held August 14-19, 1961, at Honolulu, Hawaii, bringing together scientists from 17 organizations in six countries to discuss the results of their research on tuna.

The Conference was sponsored by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, and the participants represented organizations in Canada, French Oceania, Hong Kong, Italy, Japan, and the United States.

The Conference was organized into six sections to consider the following aspects of tuna biology: (1) distribution, (2) migrations, (3) subpopulations, (4) behavior, (5) tuna oceanography, and (6) taxonomy and nomenclature. More than 40 papers on those subjects were distributed to the participants for discussion at the meeting.

The Conference immediately preceded the 10th Pacific Science Congress, which was held in Honolulu August 21-September 6, 1961, with an attendance of over 1,000 scientists from all over the world.

Three fishery research vessels were in Honolulu during the Tuna Biology Conference and were open for visits--the Shoyo Maru, of the Tokyo University of Fisheries; the Makua, operated by the Hawaii State Division of Fish and Game; and the Charles H. Gilbert, operated by the Bureau's Biological Laboratory, Honolulu.



U. S. Fishery Landings, January-June 1961

Total Catch: Data primarily for the first six months of 1961 indicate that this year's United States commercial fishery landings are about 241 million pounds ahead of the first six months last year.



Fig. 1 - In foreground are two of the more common types of boats used to catch blue crabs in Chesapeake Bay area. Usually manned by one man and powered by an outboard motor.

United States Commercial Fishery Landings of Certain Species for Periods Shown, 1961 and 1960				
Species	Period	1961 ^{1/}	1960	Total 1960
. (1,000 Lbs.)				
Anchovies, Calif.	6 mos.	2,100	1,610	5,057
Cod:				
Maine	5 mos.	1,100	1,568	2,897
Boston ^{2/}	6 "	11,200	8,407	15,548
Gloucester ^{2/}	6 "	1,400	1,874	3,199
Total cod		13,700	11,849	21,644
Haddock:				
Maine	5 mos.	1,100	1,530	3,834
Boston ^{2/}	6 "	45,400	38,633	76,695
Gloucester ^{2/}	6 "	8,200	8,795	12,107
Total haddock		54,700	48,958	92,636
Halibut: ^{3/}				
Alaska	6 mos.	12,500	14,283	21,351
Wash. & Oreg.	6 "	8,700	10,614	16,802
Total halibut		21,200	24,897	38,153
Herring:				
Maine	5 mos.	40	1,966	152,327
Alaska	6 "	15,200	19,000	78,700
Industrial Fish,				
Maine & Mass. ^{4/}	6 mos.	11,200	14,800	43,733
Mackerel:				
Jack	6 mos.	25,900	37,996	74,945
Pacific	6 "	17,300	9,232	36,808
Menhaden	6 mos.	768,100	541,232	1,999,000
Ocean Perch:				
Maine	5 mos.	33,700	26,934	78,258
Boston	6 "	300	430	1,481
Gloucester	6 "	29,300	31,981	61,673
Total ocean perch		63,300	59,345	141,412
Salmon:				
Alaska	to July 27	137,000	133,000	213,000
Washington	5 mos.	2/1,000	2/832	16,178
Oregon	3 "	2/100	2/68	5,582
Scallops, Sea, New Bedford (meats)	6 mos.	9,700	8,927	19,353
Shrimp (heads-on):				
South Atl. & Gulf	6 mos.	52,300	61,781	236,938
Washington	5 "	300	559	1,801
Oregon	3 "	70	14	881
Squid, Calif.	6 mos.	900	290	2,562
Tuna, Calif.	to July 15	178,000	161,860	283,060
Whiting:				
Maine	5 mos.	-	393	11,123
Boston	6 "	40	60	754
Gloucester	to July 23	16,000	27,199	63,112
Total whiting		16,040	27,652	74,989
Total all above items		1,388,150	1,165,868	3,538,759
Others not listed		304,250	285,110	1,391,241
Grand Total		1,692,400	1,450,978	4,930,000

^{1/}Preliminary. ^{3/}Dressed weight.
^{2/}Landed weight. ^{4/}Excludes menhaden.
 Note: Data represent weight of fish and shellfish as landed except for mollusks which are reported on weights of meats only.

Menhaden: During the first 6 months of 1961, landings totaled about 768 million pounds--up 227 million pounds as compared with the same period in 1960.



Fig. 2 - Menhaden vessel docked at a fishery industrial products plant in Empire, La.

Tuna: Landings in California, including transshipments of United States-caught fish from South America, totaled 178 million pounds to July 15--a gain of 16 million pounds as compared with 1960. The purse-seine catch was up 39 million pounds while landings by the clipper fleet were down nearly 30 million pounds.

Salmon: On the basis of the reported pack of canned salmon, it is estimated that the Alaska catch to July 27 totaled about 137 million pounds--4 million pounds more than to the same date in 1960.



Fig. 3 - Medium shrimp trawler docked at Westwego, La.

Haddock: New England landings--about 55 million pounds during the first six months of 1961--were nearly 6 million pounds greater than in the same period in 1960.

Ocean Perch: Landings at Maine ports during the first five months of the year and at Gloucester through June totaled over 63 million pounds--4 million pounds more than in the same period in 1960.

Mackerel: Landings of jack mackerel (25.9 million pounds) during the first six months of 1961 were only 68 percent as large as in 1960, while those of Pacific mackerel (17.3 million pounds) were nearly twice those for the same period last year.

Whiting: Landings at Gloucester through July 23 totaled 16 million pounds--substantially less than the 1960 landings for that period.

Shrimp: Landings in the South Atlantic and Gulf States during the first 6 months of 1961 amounted to 52.3 million pounds--somewhat less than in 1960.

Scallops: New Bedford landings through June totaled 9.7 million pounds--nearly 800,000 pounds more than in 1960. Total 1960 landings of scallops were the largest in history.



U. S. Fishing Vessels

DOCUMENTS ISSUED AND CANCELLED, MAY 1961:

During May 1961, 63 vessels of 5 net tons and over were issued first documents as fishing craft, 2 vessels less than in the same

Table 1 - U. S. Fishing Vessels^{1/}--Documents Issued and Cancelled, by Tonnage Groups, May 1961

Gross Tonnage	Issued ^{2/}	Cancelled ^{3/}
 (Number)	
5-9	29	12
10-19	8	8
20-29	4	3
30-39	3	-
40-49	2	-
50-59	5	-
60-69	4	1
70-79	3	-
240-249	1	-
290-299	1	-
360-369	1	-
540-549	1	-
770-779	1	-
Total	63	24

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

^{2/}Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft reported in the May 1961 supplement were built: 46 in 1961, 2 in 1960, and 15 prior to 1945. Assigned to various sections on the basis of their home ports.

^{3/}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.

Table 2 - U. S. Fishing Vessels^{1/-}--Documentations Issued and Cancelled, by Areas, May 1961 with Comparisons

Area (Home port)	May		Jan.-May		Total 1960
	1961	1960	1961	1960	
.....(Number).....					
<u>Issued first documents 2/:</u>					
New England	4	1	15	7	35
Middle Atlantic	1	4	2	10	16
Chesapeake	4	10	25	23	78
South Atlantic	3	5	15	22	48
Gulf	18	11	52	29	89
Pacific	32	33	70	68	147
Great Lakes	1	1	5	4	18
Puerto Rico	-	-	2	-	-
Total	63	65	186	163	431
<u>Removed from documentation 3/:</u>					
New England	1	2	6	8	22
Middle Atlantic	3	-	15	4	18
Chesapeake	2	2	17	9	21
South Atlantic	3	3	11	18	38
Gulf	5	8	44	46	88
Pacific	10	4	43	32	86
Great Lakes	-	1	8	5	13
Puerto Rico	-	-	-	1	1
Total	24	20	144	123	287

See footnotes in table 1.

month last year. But the number issued first documents the first 5 months this year was 23 more than in the same period last year.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, MAY 1961:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during May 1961 increased by 18.9 percent in quantity and 24.4 percent in value as compared with April 1961. The increase was due partially to higher imports of fillets other than groundfish (up 1.3 million pounds), frozen other tuna (up 2.1 million pounds), and lobster and spiny lobster (up 2.9 million pounds). The increase was partly offset by a 0.9-million-pound decrease in the imports of shrimp and frozen albacore tuna (down 0.7 million pounds).

Compared with May 1960, the imports this May were up by 2.1 percent in quantity and 0.4 percent in value due to higher imports of groundfish fillets (up 4.9 million pounds). Compensating, in part, for the increase was a drop of about 3.8 million pounds in the imports of frozen tuna other than albacore.

United States exports of processed fish and shellfish in May 1961 were lower by 16.3 percent in quantity and 45.5 percent in value as compared with April 1961.

U. S. Imports and Exports of Edible Fishery Products, May 1961 with Comparisons

Item	QUANTITY			VALUE		
	May	Year		May	Year	
	1961	1960	1960	1961	1960	1960
	(Millions of Lbs.)			(Millions of \$)		
<u>Imports:</u>						
<u>Fish & shellfish:</u>						
Fresh, frozen, & processed ^{1/}	83.4	81.7	1,011.2	26.0	25.9	304.8
<u>Exports:</u>						
<u>Fish & shellfish:</u>						
Processed only ^{1/} (excluding fresh & frozen)	1.4	1.8	48.7	0.6	0.6	19.2

^{1/}Includes pastes, sauces, clam chowder and juice, and other specialties.

Compared with the same month in 1960, the exports this May were down by 20.0 percent in quantity and unchanged in value. The drop in exports in May this year as compared with the same month in 1960 were due primarily to very low stocks of California sardines and Pacific salmon available for export to foreign markets.

* * * * *

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

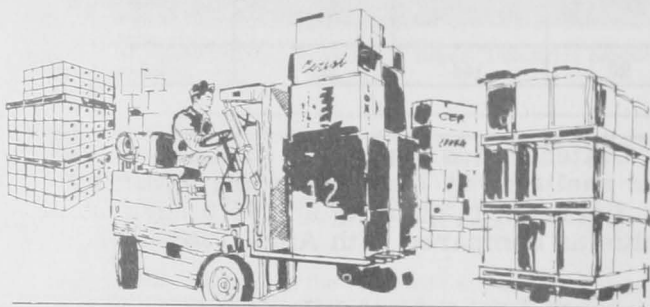
The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1961 at the 12½-percentage rate of duty is 57,114,714 pounds. Any imports in excess of the quota are dutiable at 25 percent ad valorem.

Imports from January 1-June 30, 1961, amounted to 23,575,216 pounds, according to data compiled by the Bureau of Customs.

Imports in 1960 for the period January 1-July 2 amounted to 22,698,066 pounds.

**WORLD TRADE IN UNITED STATES
FISHERY PRODUCTS, 1960:**

In 1960, the United States exported a total of \$44,165,000 of fishery products to 105 countries throughout the world. This was a



slight decrease from 1959 when exports of fishery products were valued at \$44,241,000. In 1959 the export value of U.S. fishery products was the highest since the record year of 1947 when total U.S. exports reached almost 53 million dollars.

Table 1 - United States Exports of Fishery Products, 1956-1960, by Country of Destination

Destination	1960	1959	1958	1957	1956
	(US\$1,000)				
Canada	10,309	8,644	9,200	7,253	8,107
United Kingdom	8,460	8,928	5,785	3,708	2,204
Netherlands	4,350	4,352	2,007	2,969	4,961
Japan	3,295	928	501	669	595
Philippines	2,494	5,587	2,578	6,027	8,065
Sweden	2,613	3,176	681	1,844	848
West Germany	2,201	2,888	3,043	5,099	6,121
Norway	1,390	1,296	1,063	970	1,065
Switzerland	1,082	762	387	463	473
France	1,048	766	68	259	428
Italy	643	303	158	259	339
Mexico	616	663	393	175	143
Belgium & Luxembourg	537	746	948	447	504
Venezuela	461	614	641	573	586
Australia	444	157	31	23	11
New Zealand	317	285	65	84	41
Greece	313	306	136	195	261
Cuba	175	787	490	721	743
All others	1/3,417	3,053	2,829	4,214	4,008
Total	44,165	44,241	31,004	35,952	39,503

1/Consists of shipments to 86 countries.

Canada displaced the United Kingdom as the leading market for United States fishery products in 1960, regaining the position held in the years 1955-58. Canada bought a variety of products, with shrimp remaining at the top of the list.

Table 2 - Exports of U. S. Fishery Products to Canada, 1960

Product	Value US\$1,000
Shrimp, canned	1,927
Shrimp, fresh and frozen	1,742
Salmon, canned	1,082
Salmon, fresh and frozen	369
Oysters, shucked	492
Seal furs	1,398
Fish and other marine animal oils	815
All other fishery products	2,484
Total	10,309

Not only did the United Kingdom drop back into second place in 1960, but the value of exports of United States fishery products dropped \$468,000 from 1959. Although canned salmon was still the major item shipped to the United Kingdom, it had dropped by \$1,264,000 or 15 percent.

Table 3 - Exports of U. S. Fishery Products to the United Kingdom, 1960

Product	Value US\$1,000
Salmon, canned	7,057
Salmon, fresh and frozen	150
Pearl essence	109
Seal furs	62
All other fishery products	1,082
Total	8,460

The Philippines dropped to fifth place on the list of customers for United States fishery products. This was mainly accounted for by a large reduction in purchases of both canned salmon (down \$996,000 from 1959) and canned California sardines (down \$1,843,000 from 1959).

Table 4 - Exports of U. S. Fishery Products to the Philippines, 1960

Product	Value US\$1,000
California sardines, canned	2,008
Squid, canned	402
Salmon, canned	9
All other fishery products	75
Total	2,494

Again in 1960, as in 1959, fish and other marine animal oils made up the bulk of United States fishery products exports to the Netherlands, West Germany, Norway, and Sweden. In fact these four countries received almost 87 percent of the total exports of fish and other marine animal oils. Exports of all

fishery products to these four countries amounted to \$10,412,000.

Table 5 - U. S. Exports of Fish and Other Marine Animal Oils, 1960, by Country of Destination

Destination	Value
	US\$1,000
Netherlands	3,780
Sweden	2,404
West Germany	1,888
Norway	1,335
Canada	815
All other countries	613
Total	10,835

Japan rose from 8th place to 4th place in the list of United States customers for fishery products. In 1960, Japan purchased unmanufactured shells valued at almost \$2,500,000 as compared with \$867,000 for the same product in 1959.

Table 6 - Exports of U. S. Fishery Products to Japan, 1960

Product	Value
	US\$1,000
Shells, unmanufactured	2,473
Salmon, fresh and frozen	457
Shrimp, fresh and frozen	196
Shrimp, canned	48
Shrimp, salted, pickled, or dried	48
All other fishery products	73
Total	3,295

Europe remained the leading continent receiving United States fishery products in 1960, although there was a slight drop in the total value from 1959. Europe again took more than 50 percent of the exports of fishery products. In 1960, as in the past several years, canned salmon valued at about \$7,600,000, and oils valued at \$9,800,000, were the major items shipped to Europe.

Table 7 - United States Exports of Fishery Products, 1960

Continent	Value		Total
	Edible	Inedible	
	(US\$1,000)		
North America	8,978	3,622	12,560
South America	884	83	967
Europe	10,781	12,108	22,889
Asia	3,781	2,697	6,478
Africa	325	7	332
Oceania	873	26	899
Total	25,622	18,543	44,165

Table 8 - Major U. S. Fishery Products Exports, 1960

Product	Value		Percent of Total
	US\$1,000	%	
Fish and other marine animal oils	10,835	25	
Salmon, canned	9,830	22	
Salmon, fresh and frozen	1,677	4	
Shrimp, canned	3,383	8	
Shrimp, fresh and frozen	2,303	5	
Sardines, canned	3,508	8	
Seal furs	3,309	7	
All other fishery products	9,320	21	
Total	44,165	100	

Oils, canned salmon, canned sardines, and canned shrimp were among the leading export items in 1960. These products accounted for well over half of total United States fishery products exports.

Note: Also see Commercial Fisheries Review, Aug. 1960 p. 34.



U. S. Production of Fish Sticks and Portions, April-June 1961

United States production of fish sticks in the second quarter of 1961 amounted to 15.5 million pounds and fish portions 12.5 million pounds. This was an increase of 2.6 million pounds or 20 percent in fish sticks, and 2.0 million pounds or 19 percent in fish portions as compared with the same quarter of 1960.

Table 1 - U. S. Production of Fish Sticks by Months and Type, April-June 1961

Month	Production (1,000 Lbs.)		
	Cooked	Raw	Total
April	5,229	376	5,605
May	4,720	364	5,084
June	4,545	287	4,832
Total 2nd quarter 1961 ^{1/}	14,494	1,027	15,521
Total 2nd quarter 1960 ^{2/}	11,987	939	12,926
Total 1st 6 months 1961 ^{1/}	33,613	2,211	35,824
Total 1st 6 months 1960 ^{2/}	30,603	2,199	32,802

^{1/}Preliminary.
^{2/}Revised.

Cooked fish sticks (14.5 million pounds) made up 93 percent of the total fish stick

Table 2 - U. S. Production of Fish Sticks by Areas, April-June 1961 and 1960

Area	1961 ^{1/}		1960 ^{2/}	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	21	13,376	23	10,446
Inland and Gulf States	4	1,187	4	1,350
Pacific Coast States	10	958	7	1,130
Total	35	15,521	34	12,926

^{1/}Preliminary.
^{2/}Revised.

production, while the remaining 1.0 million pounds (7 percent) consisted of raw fish sticks. A total of 12.1 million pounds of breaded fish portions (of which 9.8 million pounds were raw) and 0.4 million pounds of unbreaded portions was processed during the second quarter of 1961.

The Atlantic Coast was the principal area for the production of both fish sticks and portions with 13.4 and 6.5 million pounds, respectively. The remaining 2.1 million

Table 3 - U. S. Production of Fish Sticks
by Months, 1957-1961

Month	1961 1/	1960 2/	1959	1958	1957
	(1,000 Lbs.)				
January	6,066	5,504	6,277	5,471	4,261
February	7,059	6,535	6,352	5,925	5,246
March	7,178	7,837	5,604	5,526	5,147
April	5,605	4,864	4,717	4,855	4,492
May	5,084	3,700	4,407	4,229	3,380
June	4,832	4,362	4,583	4,702	3,522
July	-	3,684	3,790	4,574	3,821
August	-	5,006	3,879	4,358	4,643
September	-	5,417	5,353	5,328	4,861
October	-	6,554	5,842	5,485	5,162
November	-	6,274	4,831	5,091	4,579
December	-	5,322	4,743	5,467	4,014
Total	-	65,059	60,378	61,011	53,128

1/ Preliminary.
2/ Revised.

pounds of fish sticks and 6.0 million pounds of fish portions were produced in the inland, Gulf, and Pacific Coast States.

Table 4 - U. S. Production of Fish Portions by Months and Type,
April-June 1961

Month	Breaded			Un-breaded	Total
	Cooked	Raw	Total		
	(1,000 Lbs.)				
April	825	3,549	4,374	141	4,515
May	872	2,923	3,795	104	3,899
June	547	3,341	3,888	157	4,045
Total 2nd quarter 1961 1/	2,244	9,813	12,057	402	12,459
Total 2nd quarter 1960 2/	1,506	8,552	10,058	434	10,492
Total 1st 6 months 1961 1/	4,960	21,525	26,485	903	27,388
Total 1st 6 months 1960 2/	3,385	17,912	21,297	827	22,124

1/ Preliminary.
2/ Revised.

Table 5 - U. S. Production of Fish Portions by Areas,
April-June 1961 and 1960

Area	1961 1/		1960 2/	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States . .	24	6,503	21	5,202
Inland and Gulf States . .	7	5,507	6	5,012
Pacific Coast States . . .	6	449	5	278
Total	37	12,459	32	10,492

1/ Preliminary.
2/ Revised.

Table 6 - U. S. Production of Fish Portions
by Months, 1958-1961

Month	1961 1/	1960 2/	1959	1958
	(1,000 Lbs.)			
January	4,259	3,604	2,692	1,973
February	4,865	3,434	3,025	1,254
March	5,805	4,594	3,225	1,471
April	4,515	3,399	2,634	2,268
May	3,899	3,171	2,684	1,478
June	4,045	3,922	3,247	1,504
July	-	4,020	2,227	2,161
August	-	3,496	2,796	1,516
September	-	4,543	3,558	1,566
October	-	5,148	4,314	2,560
November	-	4,642	3,483	1,979
December	-	4,327	3,262	2,060
Total	-	48,300	37,147	21,790

1/ Preliminary.
2/ Revised.

Virginia

NEW PLASTIC FLOATS TO TRACE MOVEMENTS OF YOUNG FISH:

Trawlers and dredge vessels are expected to catch brilliantly-colored plastic objects, looking like brightly-colored mushrooms, in their nets beginning about mid-July along the Continental Shelf and throughout Chesapeake Bay. These newly-designed bottom drift floats were released in the water by scientists of the Virginia Institute of Marine Science for studies of bottom currents in Atlantic and Bay waters. The floats are a replacement for the drift bottles generally used to trace ocean or water currents.

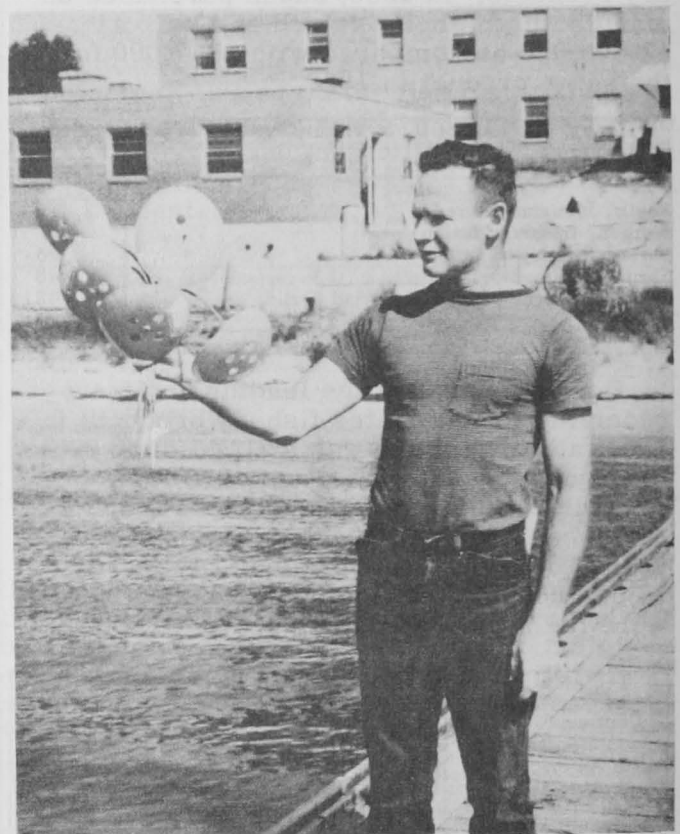


Fig. 1 - Associate Marine Scientist at the Virginia Institute of Marine Science, Gloucester Point, Va., holding a "bouquet" of plastic floats used for tracing ocean currents. Scientists at the Institute are cooperating with the Woods Hole Oceanographic Institute, Woods Hole, Mass. While surveying for fish eggs and larvae over the continental shelf, Virginia scientists toss overboard a record number of plastic floats. Beachcombers, trawl fishermen, and scallop dredgers are instructed to return them to Woods Hole.

The Institute's research vessel *Pathfinder* while engaged in its July 1961 offshore cruise released a number of these floats at stations in the lower Bay and offshore. A ring of salt holds several floats



together as they sink to the bottom. The salt ring quickly dissolves and the floats will drift with the subsurface currents and eventually be picked up by trawlers or dredges and returned to the Laboratory. A notation in each ship's log will indicate where the float was hauled aboard giving scientists valuable information regarding bottom currents of coastal and Bay waters.

In addition to permitting Virginia scientists to learn of water movements in and out of the Bay and over the adjacent shelf, these studies give a better understanding of why fishes are caught in abundance some years and are scarce during others. It has been established that the main spawning area for most Chesapeake fishes (gray sea trout, spot, croaker, menhaden, and fluke or flounder) is over the Continental Shelf offshore from Virginia. When the eggs hatch, the tiny larvae sink and are carried by bottom currents into the Bay, it is believed. During some years, the currents change course and cause the tiny fish to be carried to places other than the Bay, thus accounting for relatively small catches by sport and commercial fishermen in succeeding years.

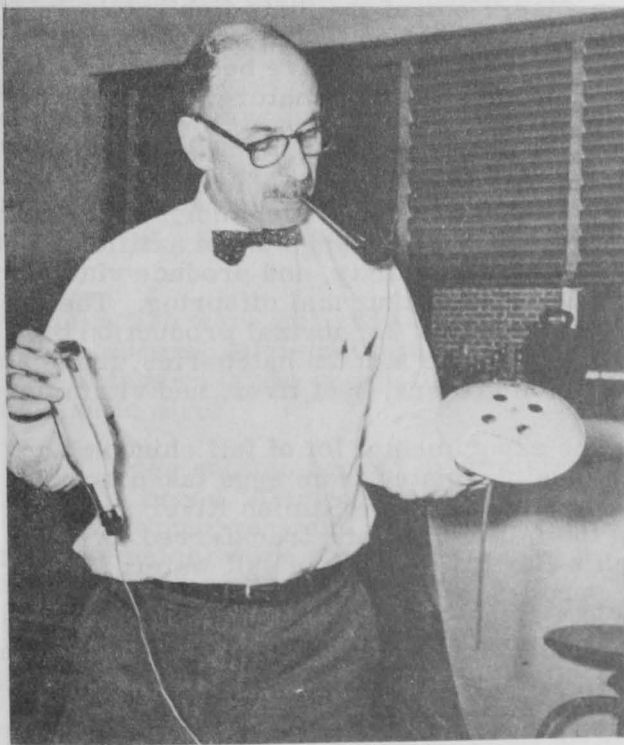


Fig. 2 - D. F. Bumpus, Oceanographer at the Woods Hole Oceanographic Institute, Woods Hole, Mass., designed the plastic float (held in his left hand) for studying ocean currents. Old type glass drift bottle is held in the right hand.

One of the important reasons why the Institute's scientists have been carrying out their offshore research programs is in order to study the currents that are responsible for the distribution of fish eggs and larvae. A clear understanding of fish populations in Bay waters could not otherwise be obtained.

A reward will be paid for the return of floats to the Laboratory. The yellow floats resemble a saucer about the size of a dinner plate and have a pink tail about 18 inches long. They will not likely be found along shores or in still waters, since they move along the bottom with tides and currents.

The Virginia Institute is releasing the floats at the request of the Woods Hole Oceanographic Institution to assist the latter organization in their study of ocean currents along the coast of Virginia.

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OYSTER MSX DISEASE REAPPEARS IN CHESAPEAKE BAY:

Evidence of this summer's first epidemic of the dreaded oyster disease MSX was reported early in July 1961 by biologists of the Virginia Institute of Marine Science. Regular inspections in June of oyster trays located at 26 stations throughout the Chesapeake Bay and its estuarine system in Virginia indicated a sudden rise in mortalities due to MSX infections.

From the disease's past history, two peaks of death are expected each summer--the first peak is reached in late July and the second in early September. This year's July epidemic appears right on schedule. Inspections of oysters in trays are conducted weekly during epidemic periods. Bimonthly checks are made during the other months.

"The epidemic is just now building toward the first summer peak kill," one of the biologists reported. "We know that oysters dying now were exposed to the disease late last summer. Those now being exposed to MSX for the first time, will have a high mortality rate during the epidemic expected to follow in September. Oysters planted during the last normal planting season (October 1960 through June 1961) will therefore be exposed during the current epidemic and die in large numbers during the one in September," he concluded. Once infected with MSX, a bed of oysters never quite reaches normal death

rates again; oysters continue dying throughout the year with major death peaks in summer and a minor one in winter.

Oyster tray stations are located in the Potomac, Little Wicomico, Severn, Rappahannock, York, and James Rivers, Mobjack Bay, and all along the seaside and bayside of Virginia's Eastern Shore. Local oysters and disease-free oysters from the upper James River are established in trays at each station for regular checks by the Institute's staff. Mortalities occurring during each check period are recorded. Laboratory diagnoses of oysters from trays are conducted daily to determine the extent of MSX infections. These tests are part of the over-all research program aimed toward finding a solution to the MSX oyster disease problem.

* * * * *

SCIENTIST PARTICIPATES IN FIELD TEST FOR CHEMICAL CONTROL OF OYSTER DRILLS:

A biologist from the Virginia Institute of Marine Science is now participating in field tests on the use of chemical barriers in controlling oyster drills at the U. S. Bureau of Commercial Fisheries, Milford, Conn., Biological Laboratory.

The Virginia scientist was invited by the Director of the Milford Laboratory to participate in and observe the use of certain chemical barriers which have been developed at the Milford Laboratory to prevent oyster drills from invading planted oyster grounds. This is a cooperative program between the Institute and the Bureau's Laboratory. The Virginia scientist will learn the techniques involved in using the chemical, evaluate the results of the test run, and consider the difficulties of applying and controlling the chemicals. From this information the Institute hopes to be able to determine the value of the use of this chemical barrier by Virginia oyster growers.

Virginia's Commissioner of Fisheries and scientists of the Institute have been especially interested in the applicability technique to Virginia conditions for some time. "We must test carefully the effect of these chemicals on the oysters themselves and on the organisms associated with oysters," the Institute's Director stated. "Though the technique shows promise, every aspect of introducing chemicals to oyster grounds

must be carefully considered so that no damage is done to the oysters themselves or to those organisms upon which the oyster depends," he added.

Predation from oyster drills, particularly on the seaside of Virginia's Eastern Shore, and also in the lower part of Chesapeake Bay, has been a major problem confronting oyster growers in those sections. These field tests are but one phase of a continuing oyster drill research program which has been in progress at the Institute for some time.



Washington

KING AND SILVER SALMON REARED TO MATURITY IN CAPTIVITY:

Chinook or king and silver salmon have been reared to maturity in captivity for the first time at the Washington State Department of Fisheries Bowman's Bay Station.

The possibility of rearing salmon in salt-water ponds until they reach maturity has long been a dream of fish culturists. A veteran supervisor of the State fish hatchery system, said that as far as he knows this is the first time salmon have been held in salt-water ponds until they mature.

Standard rearing ponds of 20 by 80 feet were used. Salmon were held to determine if they could be reared for a normal life span in artificial surroundings on an artificial diet, attain sexual maturity, and produce viable eggs that hatched normal offspring. The salmon were fed the normal production diet used in all state salmon hatcheries, made up of salmon viscera, beef liver, and vitamins.

The experimental lot of fall chinook fingerlings originated from eggs taken from adults trapped at the Samish River rack during the fall of 1954 and transferred to Bowman's Bay for rearing in salt water. A similar procedure was carried out with a small lot of 1955 brood chinook fingerlings. These two lots of fish were eventually combined and held in salt-water ponds at the hatchery until they reached maturity.

These chinook salmon matured at 2, 3, 4, and 5 years of age, following the same maturation pattern as their mates which migrated to sea and matured under natural

conditions. At two years of age, all maturing fish were males; at three years, over 95 percent were males. Maturing females were primarily 4 and 5 years old. Even those reaching 5 years of age were not over 3 pounds in weight, and approximated 19 inches.

In the fall of 1958, when fish were 4 years of age, a total of 63 females were spawned to determine fecundity and ability of eggs to survive. The fish were killed directly out of salt water, washed with fresh water, and then spawned. Eggs were shipped to the Samish River hatchery for incubation and hatching.

The eggs were approximately of normal size, but the average fecundity was only 456 eggs per female. Naturally-maturing female chinook migrating from the ocean will contain 3,000 to 5,000 eggs.

The chinook salmon eggs developed normally with an 18 percent mortality from the time eggs were taken until fry were placed in the ponds. This is higher than the expected loss, but 7 of the females had hard, non-fertilizing, glass-like eggs, which probably accounts for the above-normal loss. After 60 days of rearing in fresh water, the fish were returned to Bowman's Bay and converted to sea water. These fish were then reared for 285 days in the salt-water ponds and during that period developed normally in all respects. At the end of the rearing period the fingerlings attained an average weight of 56.7 grams (about 2 ounces) per fish.

These fish were utilized, during growth, by the Research Division to test several types of tags--plastic spaghetti, plastic dart, and plastic disc.

The silver salmon reared in captivity were 1954 brood. During the winter of 1957, 103 of the three-year-old silvers (54 males and 49 females) were spawned, yielding a total of 19,042 eggs. Average female fecundity was 388 eggs. The eggs were approximately normal in size, but a small percentage were hard and glass-like in appearance and these did not fertilize. The average weight of the spawned silvers was 0.91 pounds and the length averaged 14.3 inches.

The egg loss for the silvers during hatching was relatively high, totaling 3,977 (21 percent) and the fry loss, after 32 days of

rearing, at time of liberation was 881 fish (5.8 percent). At the time of release, these fingerlings did not show any abnormalities and in appearance were similar to fish that were offspring of naturally-reared parents.

Some of the 1954 brood silvers were not ready for spawning in the winter of 1947 and were held in the hatchery ponds for continued rearing. They matured in the fall of 1958 at four years of age. A total of 184 fish were spawned (104 males and 80 females) yielding 29,869 eggs (a fecundity of 373 eggs per female). Egg loss from take to hatching was only 12.5 percent, not considered excessive. A total of 25,500 fry were put into rearing ponds on April 14, 1959. These fish were reared for 383 days at Bowman's Bay, reached an average size of 21 fish per pound and had a total survival of 62.75 percent, from the time the eggs were taken to liberation. Some of the survivors (15,353) were sized out to an average weight of 25 fish per pound and marked with an adipose-both-ventral-fin clip, then liberated in the Samish River. Returns from those fish are expected in the fall of 1961.

Another small part of the survivors (601 fish) were sized out to an average weight of 4 fish per pound, tagged with Petersen disc tags and poly-vinyl spaghetti tags and liberated along with the fin-clipped group. Returns from those may also be expected in the fall of 1961.

The experiments, the technical assistant of hatcheries stated, show definitely that chinook and silver salmon can be reared to maturity in a hatchery pond supplied with salt water. Confinement had a depressant effect upon growth and limited the fecundity of the females to about one-tenth that of normal ocean-maturing adults moving in natural migratory periods. However, no obvious abnormalities occurred in the fry or fingerlings during the rearing period involved.

The hatchery experts said they saw no possibilities of rearing salmon in captivity for food or commercial purposes, due to the long time necessary for sizable growth and the costs involved.



Weather Station

ROBOT STATION IN GULF OF MEXICO:

In July 1961, a weird-looking apparatus resembling four huge aluminum waterless cookers set in an orange and white platform was lowered into the Gulf of Mexico, 300 miles south of New Orleans. This is a unique method of getting advance warnings of hurricanes, which may save dozens of lives and protect untold numbers of ships and aircraft.

Known as Nomad I, this sea-going robot does the work of a weatherman under circumstances too trying for humans. Nomad can operate far out at sea for at least two years, with no time off to eat, sleep, or get seasick in severe storms.

Nomad is the joint product of the National Bureau of Standards, U. S. Department of Commerce, and the Navy's Bureau of Weapons. The U. S. Coast Guard cutter Blackthorn out of Mobile was scheduled to put Nomad in place.

What goes over the side will be an aluminum platform, 10 by 20 feet in size, loaded with weather gear encased in four airtight aluminum wells sunk in the deck. After the Blackthorn's winch and boom carefully set the platform onto the ocean surface, the 15,000-foot mooring anchor system will be paid out, and the electronic instruments will be given their final adjustments by National Bureau of Standards engineers aboard the vessel.

At regular six-hour intervals, and every hour during high winds, the station will transmit weather data which its gear has measured and coded. At each transmission, Nomad tells the air temperature, water temperature, barometric pressure, wind speed and direction, and the direction of the ocean's surface currents.

Nomad transmits by shortwave radio, using partly variable-tone pulse signals and partly international Morse Code. Anyone with short wave receiving equipment can pick up the night-time signals.

In 1960, Nomad picked up the tell-tale signs of Hurricane Ethel on September 12 and broadcast data which alerted the Gulf Coast mainland approximately 48 hours before the storm itself struck. The ungainly-looking device was the first free floating, unmanned weather station in the history of weather monitoring to detect and report the presence of a tropical storm or hurricane. During the storm, Nomad partially parted its mooring and turned broadside to the heavy seas. Part of its topside equipment was submerged, but the station continued to transmit accurately and its signals were well received throughout the storm period.

These floating automatic weather stations, with their maze of electronic instruments, figure conspicuously in the planning of weather networks of the future. Although no phase of the extended test program has met with complete success, and some parts of the equipment undergo improvement each year, still, the moderately-priced (about \$50,000 per station) Nomad can be designed and anchored to hold position and transmit effectively in any non-freezing ocean area, without attendance and without maintenance for fully two years. With minor refurbishing after that period, the station will have a life expectancy of at least ten years.

Nomad will soon go into production, and seven will be established as Navy stations in storm-producing localities in the Atlantic and Pacific oceans. After the pilot production models have been proven, it is likely that Nomad will be used by the U. S. Air Force and the National Bureau of Standards' sister Commerce agency, the Weather Bureau. Not only military, but private and commercial ships and aircraft will profit immeasurably by the advance storm warnings thus provided.



Wholesale Prices, July 1961

The over-all price index for edible fishery products (fresh, frozen, and canned) for July 1961 at 129.2 percent of the 1947-49 average was down slightly (0.2 percent) from the preceding month and 0.5 percent lower than in the same month of 1960. Lower prices for fresh drawn haddock and fresh shrimp were largely responsible for the slightly lower index in July this year as compared with the preceding month. The same items plus fresh haddock fillets and frozen shrimp contributed to the slight drop in the index between July 1960 and this July.

The fresh and frozen drawn, dressed, and whole finfish subgroup index in July 1961 dropped 3.6 percent from a month earlier due to lower wholesale prices for all subgroup items except yellow pike (up 2.6 percent). In mid-July this year, prices dropped from a month earlier for fresh drawn haddock at Boston by 10.8 percent, fresh dressed halibut and salmon at New York City by 5.4 percent and 1.4 percent, respectively and fresh drawn Lake Superior whitefish at Chicago by 13.1 percent. The drop of 11.3 percent in the subgroup index from July a year ago to this July was due primarily to sharply lower prices for fresh large drawn haddock (down 43.3 percent), fresh dressed salmon, and the fresh-water species. An increase of 2.0 percent in the fresh halibut price this July over the same month of 1960 partially offset the lower prices for the other items.



New York Fulton Fish Market.

Wholesale prices for the fresh processed fish and shellfish subgroup from June to July this year and from last July to this July were about unchanged. Fresh shrimp supplies at New York City from the South Atlantic States improved and wholesale prices dropped 6.5 percent from June to July this year. The drop in the fresh shrimp price from June to July this year was just about offset by an increase of 6.7 percent in the fresh shucked oyster price. As compared with the same month of 1960, the July 1961 fresh scrod haddock fillet price was down sharply (36.2 percent) due to better landings of small haddock, and fresh shrimp prices were down 8.3 percent. These decreases were balanced out by an increase of 14.3 percent in the price for fresh oyster meats.

Wholesale prices in July this year for frozen processed fish and shellfish were up about 1.9 percent from the preceding month due to an increase of 2.9 percent (2 cents a pound) in the frozen shrimp price at Chicago and an increase of 1.6 percent (about 1/2 cent a pound) in the frozen skin-on haddock fillet price at Boston. Partially offsetting the increases were declines of about 1/2 cent a pound in prices for frozen flounder and ocean perch fillets. As compared with July 1960, the subgroup index this July was lower by 2.1 percent. Higher prices for frozen haddock (up 22.2 percent) and ocean perch fillets (up 5.7 percent) were more than offset by a drop of 9.8 percent in the frozen shrimp price.

The canned fishery products subgroup index in July 1961 was about unchanged from a month earlier except for a 3.2-percent rise in the first-hand price for Maine sardines. The canned Maine sardine pack as of the end of July this year was extremely light. Other canned fish subgroup prices remained unchanged in July this year at the levels which have prevailed for the past few months. However, the subgroup index was up 7.3 percent from July a year ago due to higher prices for canned pink salmon, and both Maine and California sardines.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, July 1961 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/		Indexes (1947-49=100)			
			(\$)		July	June	May	July
			1961	1961	1961	1961	1961	1960
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					129.2	129.5	128.6	129.9
Fresh & Frozen Fishery Products:					140.8	2/141.6	2/141.6	2/147.7
Drawn, Dressed, or Whole Finfish:					146.6	161.9	161.8	166.1
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.08	.09	77.5	86.9	78.1	136.8
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.35	.37	108.3	114.5	107.8	106.2
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.87	.88	194.3	196.6	197.7	198.0
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.53	.61	131.4	151.2	163.6	156.2
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.58	.57	136.0	132.5	167.7	158.3
Processed, Fresh (Fish & Shellfish):					146.0	145.4	142.1	146.0
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.29	.29	96.7	96.7	98.7	154.8
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.73	.78	114.5	122.4	120.9	124.8
Oysters, shucked, standards	Norfolk	gal.	8.00	7.50	198.0	185.6	179.4	173.2
Processed, Frozen (Fish & Shellfish):					115.3	113.2	112.2	117.8
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	100.8	102.1	100.8	100.8
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.33	.33	103.6	102.0	100.5	84.8
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.29	112.8	114.8	116.8	106.7
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.71	.69	109.6	106.5	105.7	121.5
Canned Fishery Products:					112.4	112.0	112.0	104.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	28.00	28.00	146.1	146.1	146.1	127.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.00	11.00	79.3	79.3	79.3	80.0
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	4.50	4.50	105.0	105.0	105.0	93.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.03	8.75	96.1	93.1	93.1	93.1

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/New series indexes based on new weighting structure; not previously available.

Note: New series indexes for January-April for the category "All Fish and Shellfish (fresh, frozen, and canned):" January 131.3, February 133.3, and March 132.0. For category "Fresh and Frozen Fishery Products:" January 146.6, February 149.3, and March 146.7; not previously available. See Commercial Fisheries Review, August 1961, for explanation.



FIRST PACK OF CANNED SALMON IN 1864

"The first pack of canned salmon in 1864 totaled only 2,000 cases but the packers had a great deal of difficulty in selling this quantity, disposing of some in door-to-door sales before wholesale buyers could be found for the remainder. The tuna-canning industry in the United States dates from 1903 and the pack of that year was 250 cases (Cobb 1919). After 9 years of effort the total pack of canned tuna was only 78,900 cases."

--Principles and Methods in the Canning of Fishery Products,
 Research Report No. 7 (page 43),
 U. S. Fish and Wildlife Service.