The grouper in the basket on the head of a woman is being carried to a market in India. It is the woman's total inventory for that day.
(Photo: FAO)

U. S. FISHERIES: THE 1966 RECORD

U. S. fishermen caught 4,341 million pounds of fishery products in 1966 that sold for $454 million--the highest dollar value in the industry's history. The catch was worth nearly $8 million more than 1965's and was 20 percent above the previous 10-year average. Volume was 435 million pounds--9 percent less than 1965's and the smallest catch since 1953. (Record catch: 5,345 million pounds in 1962.)

The lower volume reflects the serious decline in menhaden landings. The catch dropped from 1.7 billion pounds in 1965 to only 1.3 billion pounds in 1966--a decrease of 416 million pounds or 24 percent. In 1965, menhaden were 36 percent of the total U. S. catch; in 1966, only 30 percent. Other important species landed in less volume in 1966 were tuna, jack mackerel, Pacific and Atlantic sea herring, yellowtail flounders, shrimp; and, to a lesser extent, Pacific mackerel, mullet, scup, sea bass, whiting, blue crabs, oysters, and sea scallops.

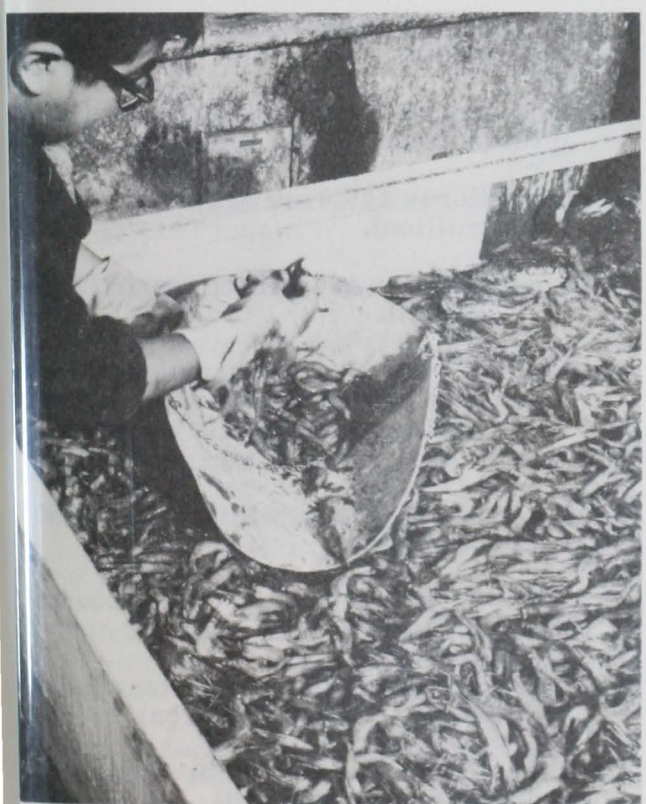


Fig. 1 - "Clean" catch consisting predominantly of pink shrimp.

On the brighter side, there was a record catch of king crabs and significantly greater catches of Pacific salmon, the best since 1949. Increased landings of alewives, anchovies, and Dungeness crabs helped to offset the total decline.

The high average price per pound of the 1966 landings, despite the smaller catch, resulted from a smaller proportion of low-price industrial species and significantly higher prices paid to fishermen for food fish. Fishermen received a record average of 10.5 cents per pound, compared with 9.3 cents in 1965. Smaller volumes in 1966 of tuna, flounders, Atlantic sea herring, Atlantic ocean perch, scup, whiting, northern lobsters, and shrimp gave fishermen more money than larger landings of these same species in 1965.

Processing Industry Had Good Year

The billion-dollar U. S. fishery processing industry gained substantially and most segments enjoyed a profitable year. There was a record pack of tuna, an excellent pack of salmon, and increases in packs of Maine sardines, clam products, alewives, and tunalike fish.

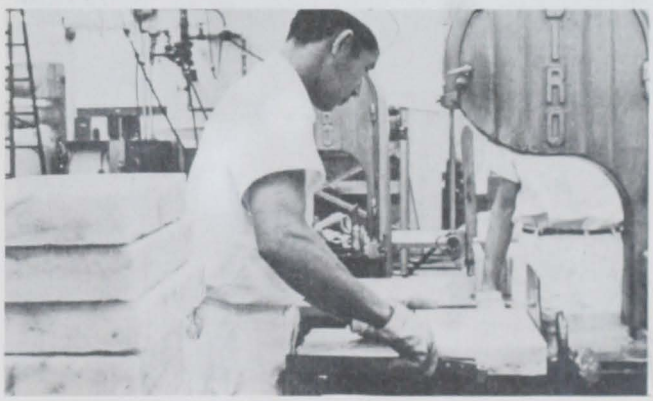


Fig. 2 - Production of breaded fish portions at Blue Water Seafoods plant. A series of cuts with high-speed saws turns blocks into uniform portions desired.

Canned fishery products were worth a record $551 million. The remarkable fish stick and portion industry established volume and value records--production was 228 million pounds worth nearly $100 million. Processors of breaded shrimp produced well over 100 million pounds to set a record worth nearly $100 million. Producers of fresh and frozen fillets had a relatively good year. The volume of groundfish fillets, as expected, was less, but other types of fillets were produced in record volume. Firms preparing fish and shellfish specialty dinners and other packaged

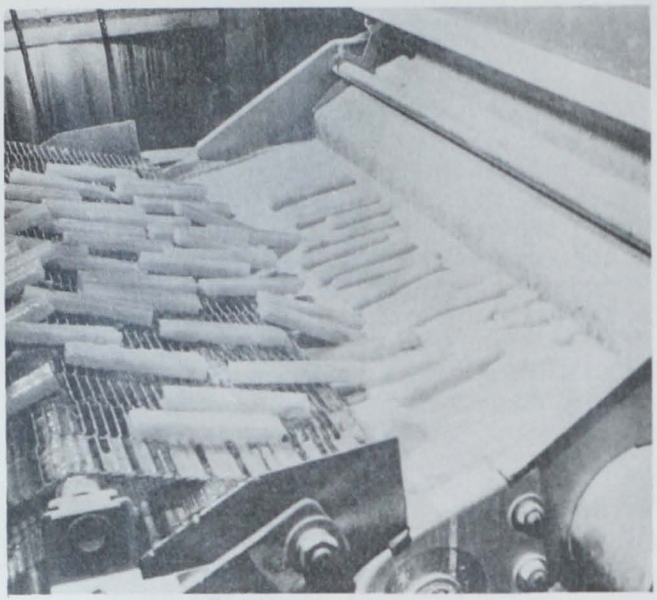


Fig. 3 - Fish sticks passing from batter to breading.

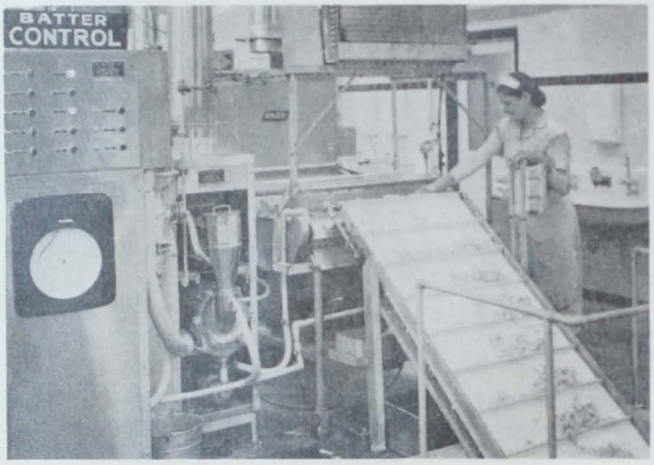


Fig. 4 - Frozen scallops about to be battered and breaded at Gorton.

fish and shellfish products also had a good year; all the records point to the spectacular growth of this industry in 1966.

The high dollar value paid to fishermen and the substantial gains of the processing industry were overshadowed by the marketing problems facing segments of the fishing industry at the end of 1966. Imports and domestic cold-storage holdings of fillets and blocks increased steadily in 1966. Despite BCF monthly statistical data forewarning the fishing industry, the accumulation of stocks continued to the year's end. Then, stocks of canned seafood were about 25 percent greater than at the end of 1965. The problem of heavy holdings--canned and frozen--was compounded by the purchase of supplies at high prices.

RECORDS SET
(Old Records in Parentheses)

CATCH

Total value: $454 million (1965: $445 million.)

Crabs, king: 158.9 million pounds (1965: 131.7 million).

The World Catch: 115.5 billion pounds (1965: 113.8 billion).

PROCESSED FISHERY PRODUCTS

Value of all fishery processed products: $1.2 billion (1965: $1.1 billion).

Tuna, canned: 19,953,567 cases (1965: 18,098,804).

Clams, canned, chowder and juice: 2.0 million cases (1965: 1.9 million).

Fish portions: 146.6 million pounds (1965: 140.5 million).

Breaded shrimp: 104 million pounds (1965: 98.1 million).

Fillets and steaks (other than groundfish): 92 million pounds (1965: 91.7 million).

IMPORTS

Import value: $724 million (1965: $601 million).

All fishery products: 8.1 billion pounds, live-weight (1964: 7.5 billion).

Edible fishery products: 2.9 billion pounds, live-weight (1965: 2.6 billion).

Industrial fishery products: 5.2 billion pounds, live-weight (1964: 5.2 billion).

Tuna, albacore, frozen: 180.2 million pounds (1965: 167.5 million).

Tuna, other than albacore, frozen: 208 million pounds (1964: 171.7 million).

IMPORTS (Contd.):

Tuna, loins and discs: 15.2 million pounds (1964: 14.9 million).

Tuna, canned: 61.6 million pounds (1961: 58.7 million).

Groundfish and ocean perch fillets, including blocks and slabs: 315.1 million pounds (1965: 295 million).

Fillets and steaks, other than groundfish: 92.7 million pounds (1965: 74.7 million).

Shrimp: 178.5 million pounds, import weight; 195 million pounds, heads-off basis (1965: 162.9 million, import weight; 179 million, heads-off basis).

Scallops, sea (meats): 16.7 million pounds (1965: 16.5 million).

Oysters, canned: 12 million pounds (1965: 8.6 million).

Sardines, canned: 57.6 million pounds (1962: 52.9 million).

Fish meal and scrap: 447,748 tons (1964: 439,143 tons).

SUPPLY (Domestic production plus imports)

All fishery products: 12.4 billion pounds, live-weight basis (1964: 12 billion).

Edible fishery products: 5.4 billion pounds, live-weight basis (1965: 5.2 billion).

Fillets, groundfish and ocean perch, including blocks and slabs: 390 million pounds (1965: 372.1 million).

Fillets, other than groundfish and ocean perch: 184.7 million pounds (1965: 166.4 million).

Tuna, canned: 455.8 million pounds (1965: 409.4 million).

Shrimp: 340.5 million pounds, heads-off basis (1965: 331.3 million, heads-off basis).

OTHER IMPORTANT FACTS

Louisiana led all states in volume: 664.1 million pounds, followed by Alaska: 588 million; California: 474.9 million; Massachusetts: 412.5 million; and Virginia: 418.4 million.

OTHER IMPORTANT FACTS (Contd.):

Alaska led all States in value: $74 million, followed by California: $53.3 million; Massachusetts: $45 million; Texas: $42.7 million; and Louisiana: $39.8 million.

Shrimp was the most valuable item: $95.8 million, 21 percent of total paid for all species and 43 percent above second most valuable item, Pacific salmon.

The Bureau of Customs reported 816 vessels obtained documents as fishing vessels--the largest number since 1949. Of this total, 551 vessels were built in 1966 for commercial fishing, and 68 were completed in 1965 but did not obtain documents until 1966. There were 197 older vessels converted to fishing in 1966.

The 404.8 million pound salmon catch was the largest since 1949; the pack of canned salmon (4.3 million cases) was the largest since 1952.

Landings of Atlantic cod, Pacific sardines, and oyster meats were the lowest on record. Atlantic sea herring landings were the smallest in 25 years; sea scallop meats, since 1946; Atlantic ocean perch, since 1939; and menhaden, since 1951.

For the 18th consecutive year, San Pedro led domestic fishing ports in catch value--$33.6 million.

Foreign vessels, principally Russian and Japanese, intensified operations off U.S. coasts. While these fleets were taking more fish and shellfish on the high seas off the U.S., this nation's catch on high seas off foreign coasts declined from 464 million in 1960 to 369 million in 1966.

Peru was the world leader in landings in 1965 followed by Japan, China (Mainland), USSR and the U. S. In 1966, the USSR took 6 million metric tons of marine products and approached their fishery goal. Norway's catch increased

OTHER IMPORTANT FACTS (Contd.):

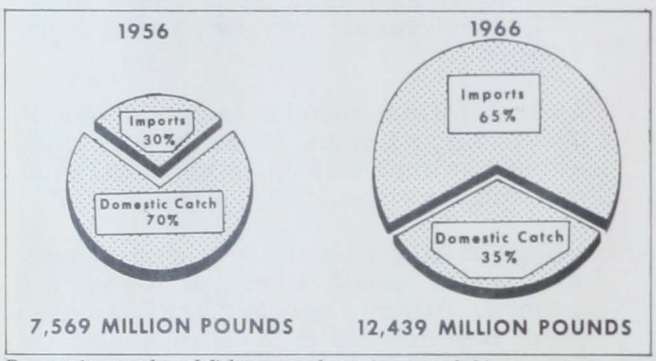
sharply in 1966 and may drop the U. S. to sixth place.

Japan led all nations in per-capita consumption of fishery products: 54.7 pounds of edible meat, followed by Sweden: 47 pounds; Norway: 44.5 pounds; China (Taiwan): 31.3 pounds; and the Philippines: 32.8 pounds. Annual per-capita consumption of fishery products in the U. S. was 10.6 pounds of edible meat.

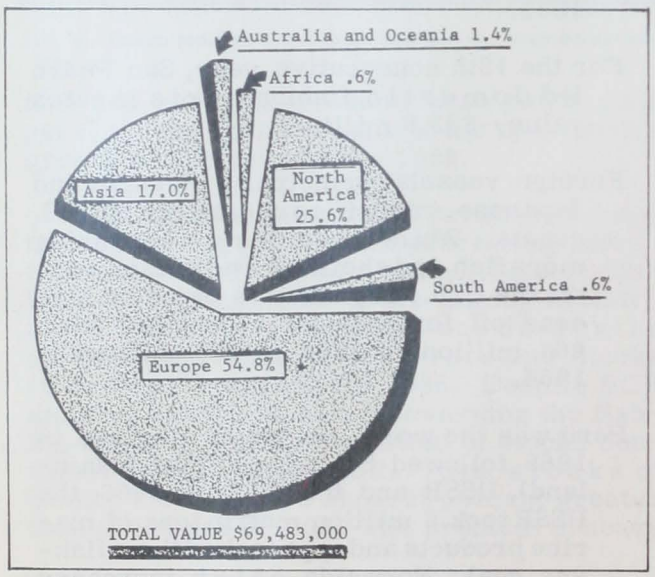
The number of fishery cooperatives in the U. S. was 102 in 1966. Members operated or owned 7,514 fishing craft.

During the 89th Congress, a number of legislative actions affecting commercial fisheries became public law. The most important measures extended the U. S. fishing limit from 3 to 12 miles (P. L. 89-658); authorized Department of the Interior to develop practicable means of producing fish protein concentrate (FPC) for human consumption (P. L. 89-701); created "sea-grant" colleges by amending 1966 Marine Resources and Development Act (P. L. 89-688); seek to control or eliminate jellyfish and other such pests (P. L. 89-720), protect and conserve North Pacific fur seals and sea otters on high seas (P. L. 89-702), and will set up a national oceanographic study to recommend coordination of numerous existing Federal programs (P.L. 89-454).

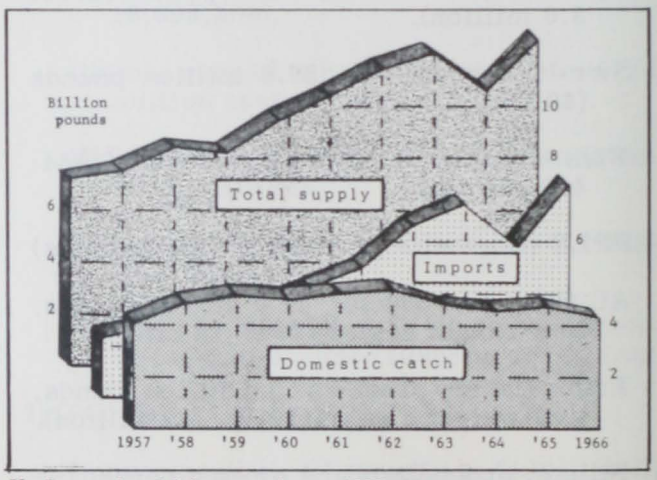
(Abstracted from "Fisheries of the United States, 1966," prepared by Branch of Fishery Statistics.)



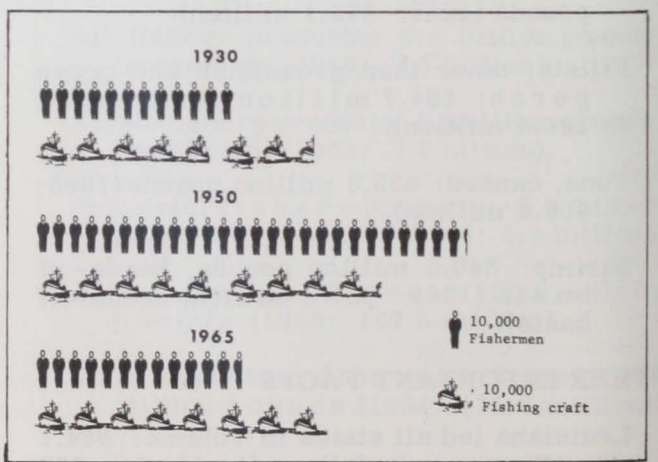
Domestic supply of fishery products increased 64 percent since 1956.



Value of U. S. exports to continent of destination, 1965.



U. S. supply of fishery products, 1957-66 (round weight basis).



Number of fishermen and fishing craft, 1930, 1950, and 1965.

U. S. OCEAN POLICY PROPOSED BY NATIONAL ACADEMY OF SCIENCES

The rapid growth of ocean science and ocean use during the past 8 years has produced enough knowledge and manpower to support a significantly larger national oceanographic program. During these years, the Federal budget for oceanography has grown from $21 million in 1958 to $221 million in 1967. So reports the National Academy of Sciences/National Research Council (NAS/NRC) in "Oceanography 1966 Achievements and Opportunities," a 183-page publication of its Committee on Oceanography.

The need for a national policy is underscored by the fact that the U. S. has not maintained a leading role in some uses of the ocean. And in 2 former major marine industries--fisheries and merchant marine--it has slipped.

The U. S. dropped from third to fifth place in total fish catch since 1958.

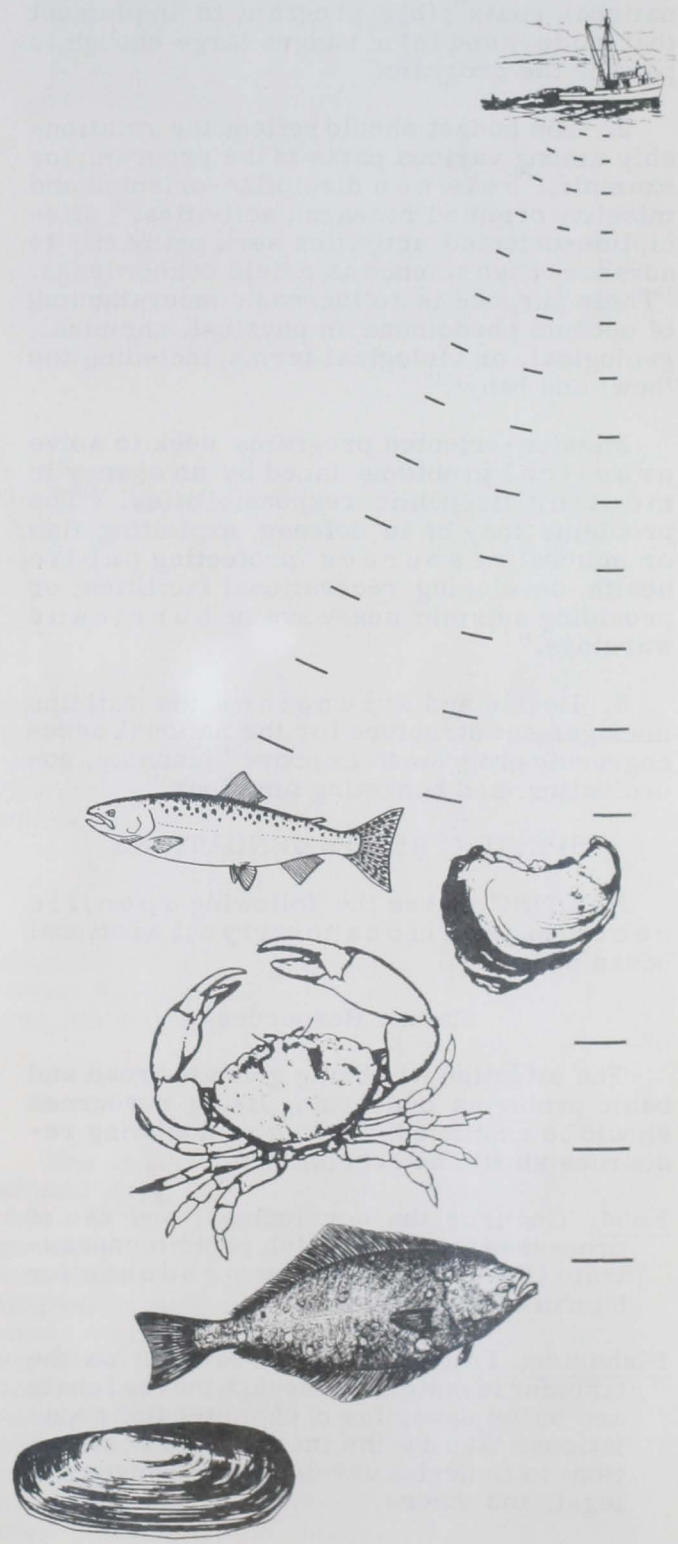
In the past 15 years, the world's merchant marines doubled in tonnage--while the U. S. merchant marine decreased.

NAS/NRC makes clear: "The purpose of the present report is to take stock of the current status of oceanography and to reassert or extend the recommendations made in our earlier report" ("Oceanography 1960 to 1970," summary chapter published in 1958, now out of print).

NAS/NRC'S 3 MAJOR RECOMMENDATIONS

NAS/NRC advises: "To reap the benefits from full and effective use of the ocean and its resources, it is necessary for use of the ocean to be concurrent with our gain of knowledge of the ocean. A national ocean policy should aim both toward increasing the extent of knowledge and toward developing the abilities that will enable us to go anywhere and do anything in the ocean that is, or may prove to be, beneficial.

"The national ocean policy should not only establish the national goals with respect to the science and use of the ocean, but it should also indicate the rate at which the goal is to be pursued. The national ocean program and budget should be based on this national ocean policy."



To carry out these purposes, NAS/NRC recommends that the U.S. should adopt: 1(a) a comprehensive national ocean policy to increase understanding and use of the ocean "at as rapid a rate as is consistent with other national goals"; (b) a program to implement that policy; and (c) a budget large enough to pay for the program.

2. The budget should reflect the relationship among various parts of the program; for example, "between discipline-oriented and mission-oriented research activities." Discipline-oriented activities seek primarily to advance ocean science as a field of knowledge. "Their purpose is to increase understanding of oceanic phenomena in physical, chemical, geological, or biological terms, including the 'how' and 'why'."

Mission-oriented programs seek to solve practical problems faced by an agency in meeting its public responsibilities. "The problems may be in defense, exploiting fish or mineral resources, protecting public health, developing recreational facilities, or providing seismic sea-wave or hurricane warnings."

3. Revise and strengthen the existing management structure for the national oceanographic program to improve "planning, coordinating, and budgeting functions."

SPECIFIC RECOMMENDATIONS

NAS/NRC makes the following specific recommendations to carry out a national ocean policy:

Marine Resources

The attention now being given to broad and basic problems concerning living resources should be continued. Studies on nonliving resources should be accelerated.

Food: Continue the development and use of processes for making fish protein concentrate (FPC) and other new products for human consumption.

Fisheries: Increase the research on the transfer of materials through the food chain and on the dynamics of exploited fish populations. Study the institutional obstructions to fisheries development--economic, legal, and others.

Minerals: Continue the development of techniques to extract minerals economically from the sea floor.

Studies on Marine Organisms: In the next 10 years, provide 4 new laboratories to study the survival requirements of young fish and shellfish. As a start, "one large-oceanarium-scale facility for fish-behavior studies" is needed.

Radioactive Wastes

The funds for basic research on the effects of artificial radioactivity on the marine environment should receive a 20% step increase.

Columbia River Studies: Continue the studies on the distribution of radioactive materials in the coastal marine environment near the Columbia River's mouth to follow changes in distribution that will result from decreases in the strength of the source.

Movement and Mixing Processes: Continue the studies of the movement and mixing of a contaminant into estuarine and coastal waters. Strongly increase the efforts in the open sea.

Routes, Rates, and Reservoirs: Studies are needed of the "natural rates of input of the elements to the sea, the distribution of elements in each reservoir, and the rates of transfer between various reservoirs, particularly for the trace elements."

Biological Transport of Elements: Strengthen studies of the distribution of stable trace elements in the biota (the fauna and flora of a region) and in the nonliving reservoirs to determine the importance of biological transport.

Effect of Radiation on Genetics: Continue the studies of radiation-produced damage to form and structure of marine organisms (morphological damage) and begin studies on genetic effects.

Biological Field Studies Utilizing Radioisotopes: Conduct studies of the mutual relations between organisms and their environment (ecological studies) in estuarine and coastal environments "wherever new low-level introduction of radioactive materials produces measurable amount of artificially introduced activity in the biota."

NEARSHORE WASTE DISPOSAL

There should be research and development studies to make possible multiple use of the nearshore zone for purposes that now often conflict--recreation, fisheries, aquaculture, waste disposal, production, kelp harvesting, and transportation.

Municipal and Industrial Wastes: Study estuarine and coastal waters on the effects of increased levels of nutrients--and changes in the balance of major and minor nutrients--on the rate of primary production, standing crop, the variations in species among the primary producers, and indirect changes higher up in the food chain.

Pesticides and Herbicides: Interior Department's Water Pollution Control Administration and Bureau of Commercial Fisheries and State agencies should support research on the effects of pesticides and herbicides on marine organisms nearshore and on the high seas.

OCEANWIDE SURVEYS

Conduct a program of deliberate and planned surveys (SEAMAP) of the open ocean, using systematic and standardized methods, which would lead to the production of charts and atlases encompassing the World Ocean. Continue the efforts to establish a worldwide navigation system with an accuracy of 0.1 nautical mile. A single system should cover the offshore areas of the U. S. up to at least 100 miles "with an uncertainty of about 100 ft. or less." The SEAMAP program needs additional shore facilities.

OCEAN ENGINEERING

"Ocean engineering data and information should be assembled and published systematically."

LONG-RANGE WEATHER FORECASTING

A global observation system should be established. "Further work should be done on numerical prediction models, extensive investigations should be carried out on basic problems of turbulent boundary-layer transport and small-scale interactions with large-scale motion." Special studies should be made of the coupling between circulations in the tropics and higher latitudes.

OCEANOGRAPHIC SHIPS

About 60 new ships are needed over the next decade. Continue to build ships of improved design to replace conversions and overaged ships. "All noncombatant surface ships used for research, development, or survey should be operated by the laboratory or agency directly concerned."

DEEP MANNED SUBMERSIBLES

"Provide a greatly improved deep-diving replacement" for the "Trieste" for oceanographic research. Build several more small two- or three-man submersibles. Shipboard-handling apparatus should be included in these construction programs.

BUOYS

Continue the work on identifying and correcting the causes of long-term failures of deep-water buoys so that they will last a year or more.

SHORE FACILITIES

An estimated minimum of $36 million is needed for more new shore facilities from 1966 to 1971. They should provide laboratory space for an increased research program and more scientific personnel entering the marine sciences.

NEW TOOLS AND INSTRUMENTS

"Development of research instruments should be supported in connection with specific research programs by funds to institutions and researchers."

DATA HANDLING, PROCESSING, AND STORAGE

The national Oceanographic Data Center should keep pace with the growing input of data. More effort should go to developing procedures for the automation of data reduction aboard ship. Data from about 5,000 oceanographic stations should be selected and made available as basic information for describing the mean properties of deep water--and to experiment with a "live atlas" or other means of presentation. This computer-compiled oceanographic data will tell a user in minutes the precise and detailed information he wants, e.g., temperature, salinity, oxygen, etc.

EDUCATION AND MANPOWER

Increase the funds for faculty salaries, graduate training facilities, and fellowships and research assistantships to ensure the necessary growth of trained oceanographers. Encourage the development of university training programs in ocean engineering.

FEDERAL ORGANIZATION FOR OCEANOGRAPHY

The Navy: Funds of the Office of Naval Research to support basic oceanographic research should keep pace with the growth of the Navy's oceanographic budget.

Bureau of Commercial Fisheries (BCF): Should provide support through grants and contracts for research projects in fishery oceanography at universities and private research institutions. (See "Interior Awards 18 Oceanography Study Grants," page 24, of this issue.)

Environmental Science Services Administration (ESSA), Institute for Oceanography and Coast and Geodetic Survey: The ESSA budget should include support for grants and contracts for basic research related to its interest. ESSA should expand its cooperative programs with the academic community.

Department of State: Should help to facilitate research-ship operations throughout world through exchange of information and speeding the movement of persons, equipment, and supplies. There should be closer liaison between ship cruise-planners and State's scientific officers--and more such officers assigned to marine programs.

INTERNATIONAL COOPERATION

The U. S. should help other countries develop national oceanographic programs. There should be more emphasis on surveys of marine resources and on training programs and research projects related to greater use of proteins from the sea by developing nations.

Federal agencies should give long-term support to research and educational activities in the marine sciences that will be carried out cooperatively by U. S. institutions and developing centers of marine sciences throughout the world.

"A world oceanographic organization should be established within the United Nations to provide a single home for the various marine scientific and technological activities now lodged in several branches of the United Nations and its specialized agencies."

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The 183-page NAS/NRC report costs $5 and is available from: Printing and Publishing Office, National Academy of Sciences, 2101 Constitution Ave. NW., Washington, D. C. 20418.

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Committee on Oceanography

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Karl Banse, University of Washington
Wayne Burt, Oregon State University
Paul Fye, Woods Hole Oceanographic Institution
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George Woollard, University of Hawaii
Richard C. Vetter, National Academy of Sciences--National Research Council, Executive Secretary

UNITED STATES

U. S. Selects Northwest as Site for FPC Plant

The Federal Government's first pilot-scale demonstration plant to make fish protein concentrate will be located in the Pacific Northwest, Secretary of the Interior Stewart L. Udall has announced. The exact location will be announced after more study. Target date for completing the plant is spring 1968. BCF now is conducting preliminary engineering studies.

The plant will be designed to demonstrate how practicable it is to manufacture fish protein concentrate. It will aid private firms by providing a basis for the design and construction of larger commercial plants.

Funds totaling $1,000,000 to build it--and $700,000 to operate and maintain it and conduct research--are included in the President's 1968 budget. Appropriations to construct one plant and lease another were authorized in November 1966 and waited on approval of fish protein concentrate by the Food and Drug Administration.

President Johnson has urged the development of FPC to proceed "on an urgent basis."

New Lined Carton to Transport Fishery Products

A Boston (Mass.) firm is manufacturing new types of containers for efficient and economical transport of fish and shellfish by land, sea or air. The containers consist of a foam plastic liner in an outer corrugated carton. They are claimed to have a high strength-to-weight ratio, excellent thermal insulation, outstanding shock absorbency, good moisture retention, and chemical inertness; they reduce packaging costs, eliminate damage, and are light for shipping purposes.

The foam plastic liner boxes are made in 3 sizes: (1) for shipping fresh fish fillets, about 20 x 12 x 4 inches; (2) for shipping lobsters, shellfish, and bulk packs of fish fillets, about 21 x 13 x 14 inches; and (3) a jumbo box designed to carry 60 pounds of live lobsters, which nests for storage, measures about 21 x 16 x 14 inches.

Special Container for Lobsters

To keep lobsters in perfect condition, the firm recommends packing them in jumbo containers with fresh seaweed and 1 or 2 of their firm's reusable ice packs. The packs consist of $1\frac{1}{2}$ or 3 pounds of frozen chemical gel in a tough polythene bag; the refrigerating properties are said to equal 5 times their weight of ice, last longer, and also are cleaner and more convenient.

The ice packs can be used many times. The manufacturers say the containers are being used increasingly by shippers in Boston, Washington, California, and Alaska to pack live lobsters for Midwestern cities and Europe. ("Fishing News International," Jan. 1967.)

1966 Lake Michigan Alewife Landings Are Double 1965's

The 1966 Lake Michigan alewife production of 29 million pounds doubled the 1965 landings and is expected to double again this year. The primary reasons are the new Menominee meal plant, which has contracted to buy the production of several new Lake Michigan trawlers, and more pound-net fishing operations in the Green Bay (Wisc.) area.

Pet food fish-freezer capacity also is being increased over fivefold in southeast Lake Michigan. A Chicago pet-food processor, who uses 60 tons of fish a day, plans to bring a Gulf of Mexico trawler for test fishing operations.

BCF's Ann Arbor exploratory fishing staff is actively aiding this burgeoning industry.

Oceanography

SCIENTISTS DETECT CERTAIN
GRAY WHALE SOUNDS FOR FIRST TIME

Marine scientists now have "conclusive evidence" that gray whales emit unique sounds other than those from locomotion and feeding, reports the U. S. Navy Electronics Laboratory (NEL), San Diego, Calif. William C. Cummings, an oceanographer in the laboratory's Listening Division, discloses that "week-long, around-the-clock studies off the San Diego coast in 1966 and 1967 show that gray whales produce distinctive, low frequency, moan-like sounds." These sounds--50 to 200 cycles a second and about 1½ seconds long--are in the frequency range of bass clef on the piano. Previously, many researchers believed gray whales did not make the sounds many other whales do.

Cummings also reported that gray whales continue their migration to Mexican waters during nighttime.

Some scientists had maintained that gray whales did not migrate at night, or did so under full moonlight when they could see.

How Study Was Conducted

The NEL research yawl "Saluda" was moored in the ocean as a platform for both visual and acoustic observations. Cummings, who was scientist in charge, explained:

"We put hydrophones (underwater microphones) on the ocean bottom. One hydrophone was located to the north of the ship and one to the south. They were separated by 1,000 feet. The distance between the hydrophones was carefully measured so that when signals were received on the two hydrophones we could use the arrival time differences and the signal strength in calculating the position of the sound source."

To aid the study, a small boat sonar mechanism designed to track whales and corroborate visual observations was used.

"Last year, the moan-like sounds were recorded in limited numbers, but were not identified for certain as sounds generated from the gray whale. This year's findings enabled us to positively link this distinctive sound to the gray whale. Another sound recorded from gray whales was from the blow as the whales surfaced, exhaled and inhaled," Cummings said.

Moan-like sounds were not always produced as the whales went by the hydrophones, and the blow sounds were recorded only when they were very close to the hydrophone.

Cummings reported: "Earlier observations have resulted in conflicting data on gray whale sounds. Some investigators were not successful in their attempt to record sounds from gray whales. Others have reported hearing high frequency clicks of the type often associated with echo-ranging. We could not confirm the presence of clicks even though observations were made during darkness and fog when the whale would be likely to employ echo-ranging to supplement its vision."

The gray whale, a baleen whale, sieves plankton from the water. Some baleen whales produce low frequency moans and groans, but never has any echo-ranging, high frequency click been recorded from a baleen type whale.

Nocturnal Migration

At night the whales migrate, Cummings said. "They did so even when there was no moon shining. They also migrated at night when the area was covered by dense fog and human visibility was limited to 125 feet."

The night migration often is revealed by a spectacular display of bio-luminescence, which presumably comes from the luminescent plankton in the water; these light up when disturbed by the whale's swimming movements. Cummings flew over migrating whales at night and could see luminescent trails behind them. "On two occasions I could see the whale from the air in a cigar-shaped area of brightened light," he said. "Consequently we are quite sure these trails were produced by whales."

What possible use could the gray whale make of his low-frequency sound? Cummings suggests that the most likely use is for communication with other whales. It is possible that they also may obtain gross information on the location of large objects--land masses, other whales, ocean bottom, or nearby ships.

"Many toothed cetaceans use high frequency clicks for echo-ranging to obtain information about the environment which they cannot see, and it's possible that grays use a low frequency sound to do the same thing--but on a much more limited scale. Of course, the behavioral significance of these moans is conjecture at this point."

Studies Conducted During Southerly Migration

The studies were conducted in mid-January 1966 and 1967, during the southerly migration of gray whales. Two hundred gray whales were seen during the week-long observations each year.

Cummings said: "One day, at 2 a.m., we were treated to a spectacular display of luminescence caused by a gray whale which came nearly completely out of the water except for its flukes. When the whale splashed down, luminescent spray was sent a good 25 to 30 feet into the air. The whale could be seen surrounded by light."

Study of the gray whale resulted from the Navy's interest in passive sonar and the identification of possible strategic targets.

* * *

U. S. WEATHER BUREAU
TO EXPAND MARINE FORECASTS

The U. S. Weather Bureau this year will expand its network of radio stations broadcasting instant marine weather forecasts by adding 15 on the east, west, and Gulf coasts to the 4 now operating. These forecasts are issued on Very High Frequency (VHF) FM broadcasts at 162.55 megacycles. This is not the commercial FM band, but special receivers costing $25 to $90 can be purchased. Owners of marine radiotelephones may need only an appropriate crystal in an unused channel to receive continuous-forecast transmission.

The 162.55 megacycle frequency will be standard throughout the U. S. for all Weather Bureau instant weather forecasts. Mariners can use the same receiver in any broadcast territory to pick up the transmission within 40 miles of any network stations.

Atlantic to Pacific Network

The 15 cities scheduled to offer service during 1967 (installation dates will vary) are: Atlantic City, N. J., Boston, Mass., Charleston, S. C., Corpus Christi and Galveston, Tex., Hartford, Ct. (with antenna on Southern Conn. coast), New Orleans and Lake Charles, La., Los Angeles and San Francisco, Calif., Jacksonville, Miami, and Tampa, Fla., Norfolk, Va., and Washington, D. C. These cities will be in addition to the four at Chicago, Honolulu, Kansas City, Mo., and New York City, where the forecasts have won favorable public reaction.

The broadcasts, strongly oriented toward marine needs, are also designed to provide useful information to the general public. They will consist of overall weather summary, radar weather summary, observations of wind, weather visibility, and sea conditions from reporting stations, and a detailed local and area forecast. One primary purpose will be to provide immediate warnings of squalls, thunderstorms, tornadoes, and hurricanes. Broadcasts will be updated immediately to reflect significant storm activities.

The forecast will be tape-recorded, then played automatically and continuously. Normally it will be updated every 2 or 3 hours, and more frequently during rapidly changing conditions. (U. S. Department of Commerce, ESSA, Feb. 23, 1967.)

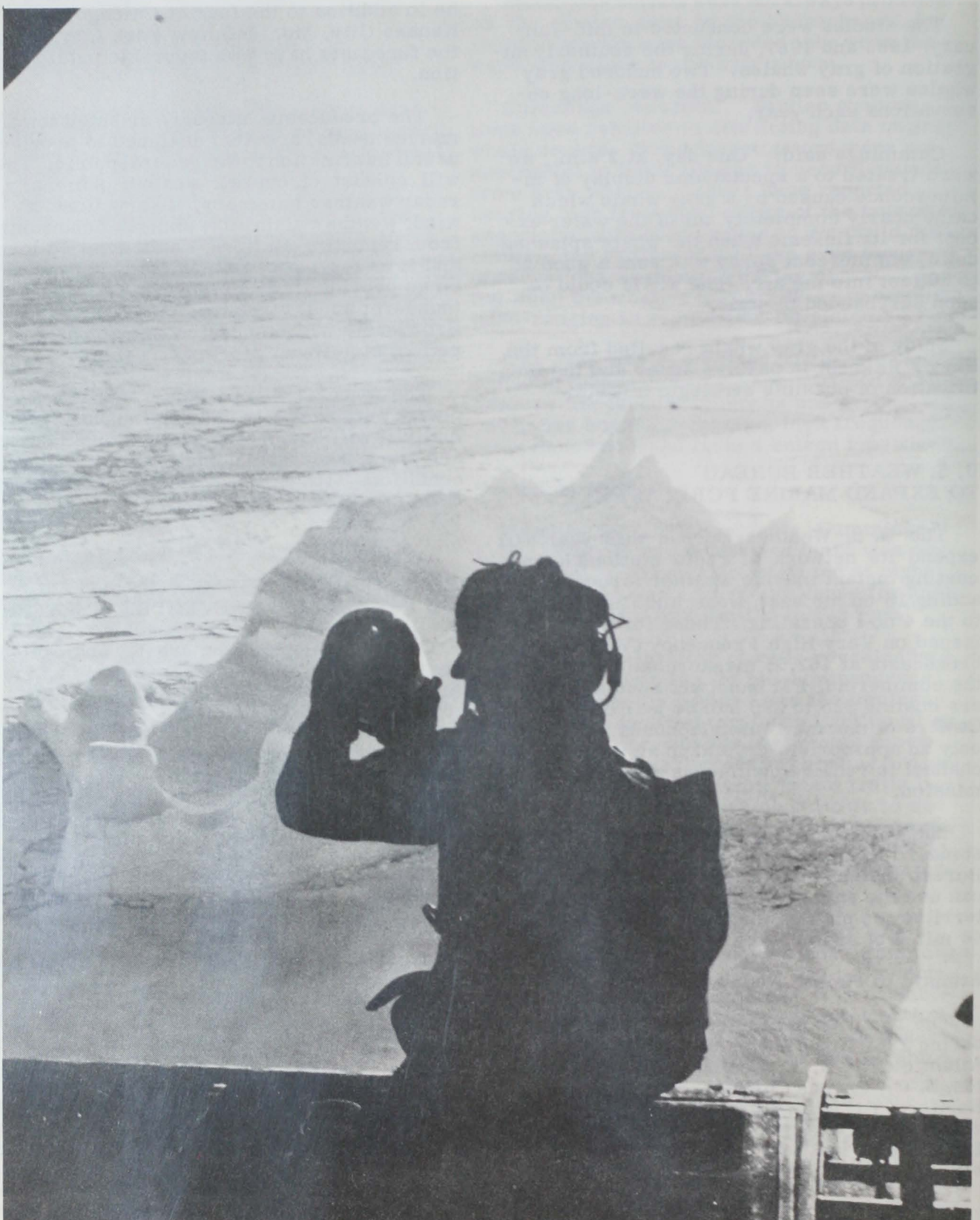
* * *

COAST GUARD'S INTERNATIONAL
ICE PATROL HAS PREVENTED DISASTER

On April 14, 1912, the great, "unsinkable" liner "Titanic," destroyed herself on an iceberg off Newfoundland. It was her maiden voyage; 1,500 persons died.

There were many memorials--but the most lasting is the operation of the International Ice Patrol, under U. S. Coast Guard direction, now in its 53rd year. The Patrol is the world's most successful international effort to promote safety at sea. The Coast Guard reports that not one life has been lost in North Atlantic shipping lanes due to iceberg collisions since the Patrol's inception in 1914.

Every year since then, except for intervals in the World Wars, Coast Guard ships and aircraft have waged their annual war against the iceberg menace. Now, and throughout the ice season, early March-June or July, ice reconnaissance is carried out by aircraft deployed from their permanent base at Elizabeth City, N. C., to Argentia, Newfoundland. And standing by is the cutter "Acushnet" out of Portland, Maine.



A Coast Guardsman in rear cargo doorway of Ice Patrol plane aims calcium chloride-rhodamine "B" dye bomb at iceberg. The iceberg--in Davis Strait off Baffin Island--is imbedded with bright vermillion stain for future identification and aerial tracking. (Photo: U. S. Coast Guard)

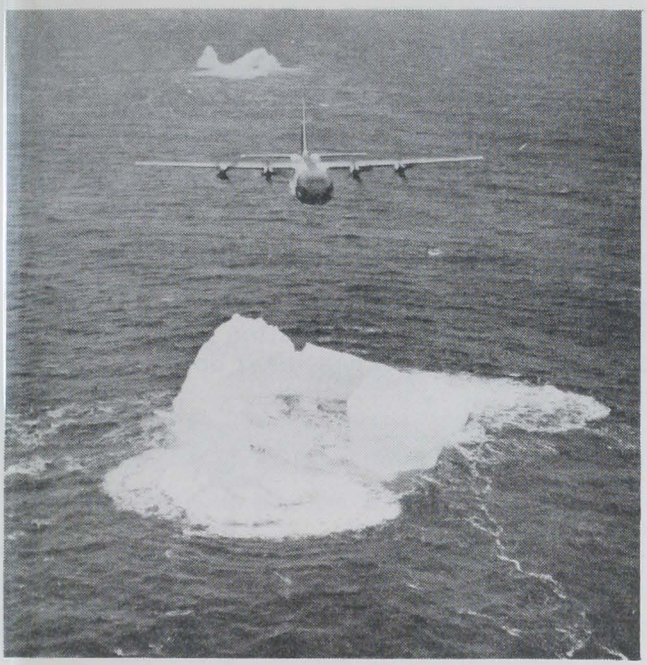


Fig. 1 - Ice Patrol Plane Hedge-Hopping Icebergs--Since World War II, aircraft, not ships, have performed the major part of the Ice Patrol's work of hunting and tracking icebergs. In this head-on view of an HC-130-B "Hercules" Ice Patrol plane, the plane is hedge-hopping a row of icebergs off the Labrador Coast. The berg in foreground was selected for tracking of movements with the currents by marking it with aerially dropped calcium chloride-rhodamine "B" (brilliant red) dye bomb.
(Photo: U. S. Coast Guard)

Patrol Is Increasingly Scientific

The Patrol has assumed an increasingly scientific character. Today, it uses the techniques of modern science to do its job. It watches for floating bergs--and also gathers information on the phenomena of northern waters. It is a basic part of the Coast Guard's expanding, century-old, oceanographic program.

During the 1967 iceberg hunt, oceanographic scientists will attempt to link iceberg detection techniques with weather-satellite photo reconnaissance. The Coast Guard will install a transceiver at Patrol Headquarters in New York, which may be able to receive directly weather-satellite photos of ocean areas covered by the Patrol. This information will be combined with data from planes equipped with radiometric iceberg detectors to provide sharper definition and location of the areas under surveillance. Eventually, the Coast Guard plans to take part in a satellite system that will provide higher resolution for earth phenomena.

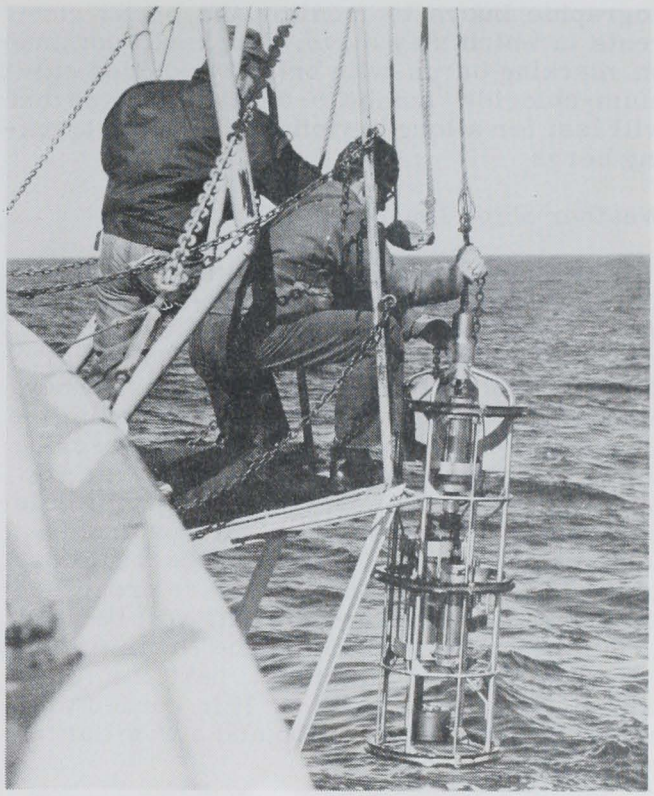


Fig. 2 - Ocean Science Important to Ice Patrol Vigilance--The constant study of the ocean currents, which greatly influence iceberg movements, is important to the Ice Patrol's predictions and tracking plots for iceberg seasons. Here, a Salinity Temperature Depth Sensor system is used on the Coast Guard oceanographic vessel "Evergreen" on a mission to determine if the source of the Labrador Current is in the Hudson Strait. The Sensor systems instantaneously record readings of salinity, temperature, and depths down to 1,500 meters.
(Photo: U. S. Coast Guard)

Instrument Can Isolate Berg

The radiometric iceberg detector, developed by Coast Guard and Sperry engineers, "is based on the principle that all matter emits electromagnetic impulses of varying intensity." The detector measures each "signature" and makes it possible to determine whether an object is ice or some other floating object.

Coast Guard oceanographers will continue to study the Gulf Stream and Labrador Currents to understand better these forces that strongly influence the drift of huge ice islands, sometimes as large as office buildings. Also, they will continue to study North Atlantic waters through sampling, salinity measurements, and analysis of marine organisms. As an added surveillance device, the Coast Guard will continue to experiment with large ocea-

nographic buoys to monitor the ocean currents in which they move. Work will continue on marking bergs with brightly colored calcium-chloride "bombs"--to develop a type that will last for a long period and facilitate tracking bergs.

Weather Ships Used Too

The Coast Guard also uses weather ships. During their 3-week patrols in 10-mile-square sectors of the North Atlantic, the cutters transmit weather and other meteorological data to transoceanic ships and planes. They also conduct marine studies. They assist the Coast Guard in its growing effort to describe the water mass exchange between North Atlantic and adjacent waters. They gather valuable data for studying drift patterns and deterioration rates of icebergs. Observations of the Ice Patrol and the ships are processed through a computer and the data will be used to build a dynamic model of the North Atlantic. The model is an integral part of any oceanic prediction system. It is needed to solve the iceberg detection and surveillance problem.

Can the "white monsters' be destroyed? To date, they have resisted fire-bombs, gunfire, and chemicals. Relentlessly, the Greenland glaciers grind their way to the sea, and the bergs detach themselves into the North Atlantic. So far, the Coast Guard says the most practical defense against them is to watch their movements.

17 Nations Contribute

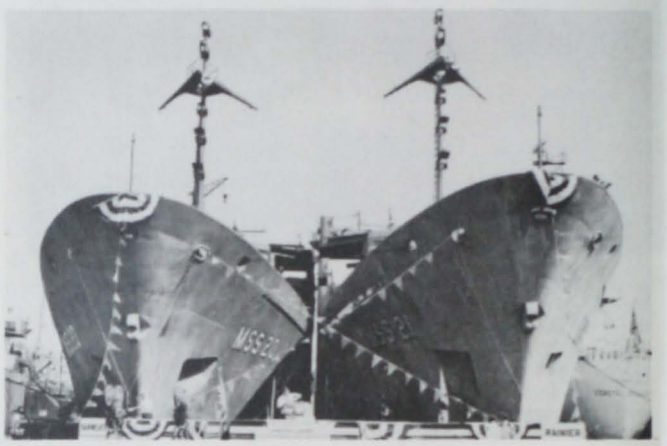
The 1967 Patrol is a tribute to the foresight of the participants in the First International Safety Conference held at London in 1913. The Conference recommended the formation of an "International Ice Observation and Ice Patrol Service" under U. S. administration. In 1914, the job was given to the U. S. Coast Guard.

At present, 17 nations contribute to the Patrol on a "pay-as-you-benefit" basis: Belgium, Canada, Denmark, France, Germany, Great Britain, Greece, Italy, Japan, Liberia, Netherlands, Norway, Panama, Spain, Sweden, the United States, and Yugoslavia.

* * *

TWO SURVEY SHIPS LAUNCHED

Two $4,000,000 hydrographic survey ships were launched March 15 in Jacksonville, Fla., by the Environmental Science Services Administration (ESSA), U. S. Department of Commerce. The vessels are the USC&GSS "Fairweather" and "Rainier." The 231-foot 1,627-ton ships are being constructed for ESSA's Coast and Geodetic Survey. They are designed to chart U. S. coastal waters to help provide safe navigation for commercial shipping and recreational boating.



Preparing launching ceremonies for the two new survey ships USC&GSS Fairweather and Rainier. (Photo: ESSA)

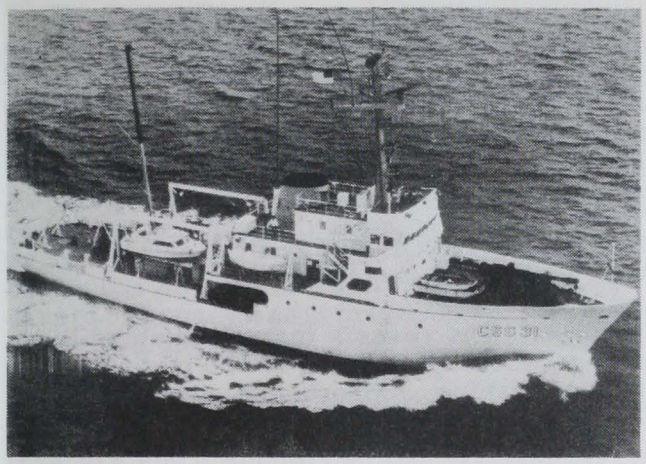
The ships are scheduled to be completed later this year. Another vessel of the same class, the USC&GSS "Mt. Mitchell," was launched November 1966 and also will be completed this year. The 3 vessels will replace others being retired.

The Fairweather and Rainier will have welded steel hulls strengthened for navigation in ice. Each will be propelled by twin-screw diesel engines through reversible-pitch propellers controlled either from the engineroom or the bridge. The engineroom will be monitored via a centralized automated system. A bow thruster will facilitate better ship control while on station or when docking. Each ship will be equipped with the latest electronic, depth recording, and positioning equipment.

* * *

"DAVIDSON" COMMISSIONED

A new hydrographic survey ship, the USC&GSS Davidson, of ESSA was commis-



New hydrographic survey ship USC&GSS Davidson. (Photo: ESSA)

sioned March 10. The 175-foot, 996-ton vessel brings to 14 the number of hydrographic survey, ocean survey, and wire drag ships in ESSA's fleet.

The ship was launched at Norfolk, Va., last May 7. She is designed for hydrographic coastal surveying, including the setting up and support of shore parties, and also has limited oceanographic facilities.

The Davidson is equipped with specialized depth recorders and positioning systems. She is built of welded steel construction strengthened for navigation in ice and will be propelled by diesel engines, with twin-screw, controllable-pitch propellers. The vessel has accommodations for 6 officers and 30 crew.

The Davidson is a sistership of the USC&GSS "McArthur," commissioned in December 1966 at Norfolk.

* * * *

MARINE TECHNOLOGY SOCIETY TO MEET IN JUNE

The Marine Technology Society (MTS) will hold its 3rd Annual Conference and Exhibit in San Diego, Calif., June 5-7, 1967. The theme: "The New Thrust Seaward."

The Conference will have 11 technical sessions of 60 papers on Federal, state, and regional aspects of oceanography; navigation and oceanography; minerals and mining; man-in-the sea; undersea materials; power sources; deep submergence; physical oceanography; and unmanned ocean systems.

Note: For more information contact Charles W. Covey, Suite 1000, 1117 N. 19th Street, Arlington, Va. 22209.

Foreign Fishing Off U. S. Coasts, February 1967

IN NORTHWEST ATLANTIC

Soviet: After a nearly $2\frac{1}{2}$-month absence, the fleet resumed fishing off New England and New York. Soviet fishing this year began late in January. U. S. fishermen reported several stern trawlers conducting exploratory operations. Several days later, on Feb. 1, a small fleet of 16 factory stern trawlers and 2 support vessels was sighted in a concentrated area south of Montauk Point, Long Island (Hudson and Block Canyons). Moderate catches of fish consisted primarily of red hake and small amounts of whiting (silver hake). General servicing of the stern trawlers by support vessels was also noticed.

On Feb. 15, 1967, 33 Soviet fishing (21 stern trawlers, 9 medium trawlers) and support vessels were sighted 80-120 miles south of the Long Island-Cape Cod coast. They were widely dispersed on the edge of the Continental Shelf. The fleet was divided into 2 parts: one--11 factory stern trawlers--was engaged in what appeared to be a limited fishery for red hake. Small catches were observed on only 2 vessels; on others, the crews were repairing trawl gear. This part of the fleet was about 85 miles south of Montauk Point, Long Island, N. Y., on the western border of ICNAF's subarea 5 (71°29' W.).

The second fleet also was fishing for red hake, to the east of the first one (69°33'W.). It consisted of 10 stern trawlers and 9 medium side trawlers. Moderate to heavy catches were observed in the open storage areas on deck.

There was little or no evidence of whiting (silver hake) among the catches. Crewmen of the large side trawlers were bagging fish in sections of netting. Bags already filled and lashed together were heaped on deck for delivery to a nearby factory base ship of the "Pionersk" class, recently constructed for the USSR in Poland.

Dehydration plants were working on many stern trawlers.

No vessels were sighted outside the ICNAF Convention area.

During February, 41 individual vessels were sighted and identified as 25 factory stern trawlers, 9 large refrigerated side trawlers, 2 medium side trawlers, 3 refrigerated fish transports, 1 factory base ship, and 1 tanker.

The Soviets appeared at least moderately successful in the red hake fishery. But their fleet was less than half of the over 90 vessels reported in February 1966, so it is almost certain that total red hake catches are far below those of February 1966.

IN GULF OF MEXICO

Soviet and Cuban: U. S. shrimp vessels returning from fishing grounds in the southern Gulf of Mexico reported concentrations of Soviet stern trawlers and Cuban trawlers somewhat inside 12 miles off Cabo (Northeasternmost point of Yucatan Peninsula, Mexico). They seemed to be after finfish not shrimp.

No foreign vessels were reported fishing off or near the U. S. Gulf Coast.

OFF CALIFORNIA

Soviet: Fishing off California in February was about the same as in January 1967: 1-4 fishing and support vessels were sighted each week about 14 miles off coast. No Soviet vessel was fishing within 9-mile contiguous fishery zone. On February 22, however, the U. S. Coast Guard permitted a 3,000-gross-ton refrigerated fish carrier "Dekastri," built in Sweden, to come within 4 miles off Point Reyes (in Drake's Bay, about 25 miles northwest of San Francisco) to accept the catches of two Soviet large stern trawlers (BMRTs "Kuba" and "Boris Gorinskii"). A Soviet tanker, the "Sinegorsk" was also allowed to enter the 9-mile fishery zone to refuel the fishing vessels. A Coast Guard cutter supervised the 2-day operation.

The small number of Soviet vessels indicates that for the time being the USSR is still conducting exploratory fishing. Most basic fishery research apparently has ended. The commercial vessels now are sampling to determine commercial potential.

During the weekly patrols, no Soviet vessel was observed fishing and no catch was seen aboard. As a result, there is no information as to species actually caught.

The fact they unloaded catches on a refrigerated fish carrier indicates good catches. From the knowledge of fishery resources present in areas of Soviet fishing, the California State Fish and Game Commission concluded that most catches are probably species of Pacific rockfish.

OFF PACIFIC NORTHWEST
(Washington and Oregon)

Soviet: The vessels increased steadily during February--from 1 at the beginning to about 10 fishing, support, and research vessel by month's end.

Most fishing was off Oregon, although 1 research vessel was sighted exploring off Washington's coast.

Fishing off Oregon has been off Newport area. All vessels operated seaward off the 9-mile contiguous fishery zone. The catch primarily was Pacific hake. The best catch observed was on February 14, when one SRT landed 30,000-40,000 pounds of hake in one drag.

The greatest number (12) of fishing and support vessels was sighted during the surveillance flight in the fourth week, ending Feb. 23: 3 large stern trawlers, 6 medium side trawlers, and 3 support vessels (refrigerated fish carriers and tankers).

Two of the 6 medium trawlers were fishery research and exploratory vessels: one, the "Ogon," traditionally has conducted fisheries research in the northeastern Pacific for the Soviet Pacific Scientific Research Institute for Fisheries and Oceanography (TINRO); the other, the "SRTM-8437," is an exploratory research vessel of the Sakhalin Fisheries Administration.

The pattern of Soviet fishing shows an intensive exploratory activity. As in 1966, this should culminate soon in increased fishing off the Pacific Northwest.

Japanese: Two stern trawlers were exploring off Washington and Oregon coasts in February. Both ocean perch and hake were seen on the vessels.

OFF ALASKA

Soviet: About 130 vessels were fishing during February.

The Soviet Pacific perch fishery in the eastern Gulf of Alaska was continued by about 30 fishing and support vessels. One trawler was active on the Portlock Bank in the central Gulf; in the western Gulf, the fishery was continued by about 6 trawlers and one support ship.

Shrimp fishing on the Continental Shelf surrounding the Shumagin Islands was continued by at least 20 trawlers and 1 canning factoryship. The shrimp catch during the first 20 days of February was nearly 4.9 million pounds, more than shrimp quota for the entire month.

Herring fishery in the eastern Bering Sea failed to develop this year. A few vessels (5 trawlers and 4 support ships) were fishing in mid-January. But, like 1966 and 1965, they failed to locate significant herring concentrations. This accounts for the many vessels (70) fishing for eastern Bering Sea flatfish. Because of the scarcity of herring stocks, the quota was not met.

The eastern Bering Sea flounder fishery was continued by about 50 trawlers and 20 support ships.

Japanese: About 31 vessels were fishing in Alaska during the month.

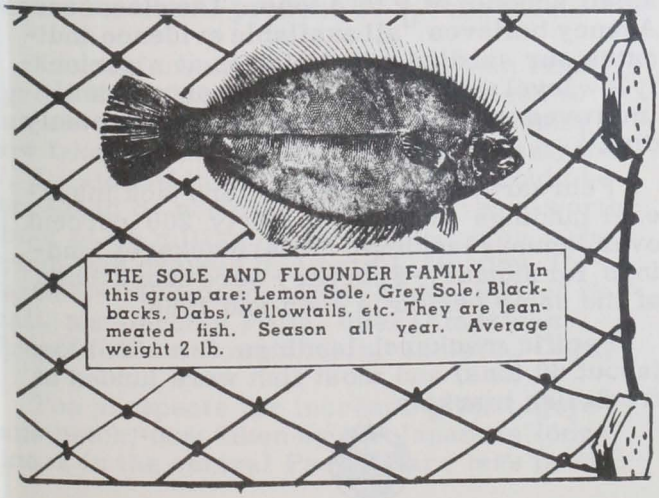
The Pacific ocean perch fishery on Albatross Bank was continued by the factory trawlers "Daishin Maru No. 12," "Yutaka Maru," and "Ryuyo Maru," supported by the reefers "Reiyo Maru" and "Haruna Maru."

The Alaska pollock fishery north of Fox Islands was conducted by the factoryship "Chichibu Maru" (replaced by "Meisei Maru No. 2" about mid-month) and accompanying trawlers "Aso Maru," "Zuiyo Maru No. 2," "Akebono Maru No. 52," "Tenyo Maru No. 3," and "Inase Maru No. 5."

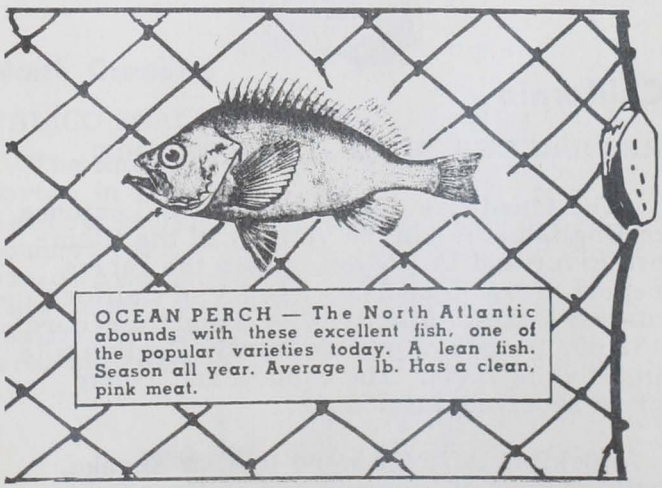
One longliner, the "Fukuyoshi Maru No. 35," fished for sablefish north of central Aleutians.

At the end of February, 2 king crab factoryships, the "Tainichi Maru" and "Keiki Maru," were reported en route to the king crab grounds in eastern Bering Sea.

NOTE: The first U. S. Fisheries Exposition at Suffolk Downs, Boston, Mass., will be held October 10-14, 1967--instead of October 7-14 as first announced by its organizers.



THE SOLE AND FLOUNDER FAMILY — In this group are: Lemon Sole, Grey Sole, Blackbacks, Dabs, Yellowtails, etc. They are lean-meated fish. Season all year. Average weight 2 lb.



OCEAN PERCH — The North Atlantic abounds with these excellent fish, one of the popular varieties today. A lean fish. Season all year. Average 1 lb. Has a clean, pink meat.

STATES

Alabama

1966 CATCH WAS UP

Alabama had total landings of 20,300,000 pounds of fisheries products in 1966 worth $6,600,000. The 1965 figure was 17.8 million pounds worth $5 million dockside.

Shrimp led with 10,600,000 pounds worth $4,915,000, followed by food fish, 6,200,000 pounds worth $888,000; crabs, 2,200,000 pounds worth $80,000; and oysters, 1,300,000 pounds valued at $617,000.

Alaska

KODIAK KING CRAB CATCH DECLINES

The catch of king crab per unit of effort in the Kodiak Island area has been declining since late 1966. Weather explains part of this. Some fishermen are considering a switch from king crab to Dungeness crab fishing.

There is some basis for the belief that the sustainable yield of some stocks could have been reached or passed during 1966. A computer program is being developed to analyze all tagging and recovery data collected since May 1961. The data may serve to define the geographical ranges of various stocks of king crab being taken in the Kodiak Island area.

California

RESOURCES AGENCY ISSUES REPORT

The trawl fleet made "exceptional catches of English sole" in the vicinity of the Klamath River and Pt. Reyes, states the recent report of the Resources Agency of California. A Eureka otter trawler caught a record 132,000 pounds of predominantly English sole in 3 fishing days. The captain and 3-man crew received $10,552.82.

Rockfish landings were light at Eureka, and landings of bocaccio and chilipepper in the Fort Bragg area were moderate. Landings at Monterey were below par, but catches off Morro Bay and Santa Barbara were moderate.

Monterey draggers complained of competition from 2 Soviet stern-ramp trawlers operating between Ano Nuevo and Davenport on productive grounds fished frequently by local vessels. One captain reported that while fishing 12 miles off Davenport, on February 16-17, he was sandwiched between 2 Soviet vessels. He reported both vessels with large hauls of rockfish taken with mesh smaller than the U. S. $4\frac{1}{2}$-inch minimum size.

About 10 boats were fishing for crab in the San Francisco area--concentrated at Russian River, Bodega Bay, Pt. Reyes area, and in deeper water between Farallones and Pt. Reyes.

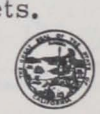
About $5\frac{1}{2}$ million pounds of crab had been landed at Eureka, Trinidad, and Crescent City by mid-February. Total landings for the Fort Bragg-Crescent City area were expected to top 6 million pounds by month's end.

No Sardines for Terminal Island Canneries

The 1966/67 cannery season closed March 1, 1967--the poorest on record and the first in which no sardines were delivered to Terminal Island canneries. Statewide landings during the cannery season were estimated to be under 175 tons. Nearly all of the fish were sold for bait because of the higher price of $200-400 per ton. Catches during the past season were almost all large, old fish and primarily fish mixed with mackerel or very small schools of $\frac{1}{4}$ to 3 tons. The Resources Agency believes "all available evidence indicates our sardine population is at a seriously low level with the prospect of significantly improved catches in the near future extremely dim."

February had good weather and jack mackerel landings increased nearly 200 percent over January landings. Total mackerel landings for January-February were above those of the same period in 1965 and 1966.

Pacific mackerel landings remained low (about 60 tons) and most fish were landed at fresh fish markets.



Hawaii

BOOK INDICATES NEW TUNA RESOURCES

A very large potential fishery resource exists in the central Pacific Ocean, states a new, 266-page book published by the State of Hawaii. The book, "Proceedings of the Governor's Conference on Central Pacific Fishery Resources," is based on a Hawaiian conference of last year. A dozen scientists reviewed the knowledge of Pacific tuna fisheries and estimated their potential increase. Sponsored by Hawaii and BCF, the conference was chaired by John C. Marr, BCF Area Director, Hawaii, and Michio Takata, Director, Hawaii Division of Fish and Game.

A large stock of unfished skipjack tuna in the central Pacific holds the most promise; it is untouched, except by the small Hawaiian fleet. (Skipjack are widely caught by the Japanese in the western Pacific and by California-based vessels off Mexico and Central America.)

A theory advanced by Brian J. Rothschild, BCF Biological Laboratory, Honolulu, suggests that the spawning grounds of the eastern Pacific skipjack lie somewhere in the equatorial central Pacific. They move to American shores early in their lives and support an annual catch of about 70,000 tons. After less than a year there, they return to the central Pacific to spawn.

Skipjack and Yellowfin Catches Can Be Increased

Rothschild and Ralph P. Silliman, BCF Biological Laboratory, Seattle, estimated that at least 150,000 tons of the valuable skipjack might be taken annually. This would almost double the entire present U. S. tuna take.

The conference group on yellowfin tuna agreed that if methods could be devised to harvest yellowfin tunas smaller than those now taken by the Japanese longline fleet, the U. S. catch of this valuable species could be increased by about 50,000 tons a year, worth about $12.5 million to U. S. fishermen. The group was chaired by Garth I. Murphy, Department of Oceanography, University of Hawaii, and Jerome Pella, Inter-American Tropical Tuna Commission, La Jolla, Calif.

The prospects for increasing the bigeye tuna catch, now taken by the Japanese long-liners in the central Pacific, are less promising. Ralph P. Silliman and Vernon E. Brock, Dept. of Oceanography, University of Hawaii, estimated that the catch could not be increased materially.

The key to the problem of greatly expanding the fisheries is the development of new techniques and gear to harvest the new stocks economically. Dayton L. Alverson, Base Director, BCF Exploratory Fish and Gear Research Base, Seattle, and Albert L. Tester, Department of Zoology, University of Hawaii, agreed that the present Hawaiian industry could be stimulated by new approaches to bait handling and gear. Tapping the new resources requires study of tuna behavior--particularly the kind conducted by BCF's Honolulu Laboratory with sonar equipment aboard its research vessel "Townsend Cromwell."

The new book also contains background papers reviewing research results on tunas throughout the Pacific.

Mississippi

1966 LANDINGS DECLINED

Mississippi's landings in 1966 were 255,021,000 pounds worth $8,594,000. In 1965, the total was 371.2 million pounds valued at $9.6 million.

Industrial fish, including menhaden, composed the bulk of landings. They totaled 240 million pounds worth $4,340,000. Other landings were: food fish, 4,100,000 pounds worth $930,000; shrimp, 7,335,000 pounds at $340,000; crabs, 1,374,000 pounds valued at $97,000; and oysters 2,220,000 pounds at $586,000.

North Carolina

CALICO SCALLOP INDUSTRY IS ACTIVE

The North Carolina scallop industry reported in mid-March that it was producing calico scallops at the rate of 10 million pounds a year. On March 13, twelve vessels produced 98,000 pounds of calico meat. This fishery developed with BCF technical assistance and the cooperation of State and local interests.

Oregon

WINTER SALMON CATCH WAS GOOD

The best chinook landings since 1953 and the largest steelhead take since 1961 marked the recently completed winter commercial fishing season on the Columbia River, reports Herman P. Meierjurgen, Oregon Fish Commission chairman. The season opened on February 15 and ran through March 1. Preliminary estimates show that 7,280 spring chinook weighing 148,900 pounds and 9,900 steelhead weighing 97,200 pounds were taken. The figures include total fish landed at both Oregon and Washington points. The average catch for the winter season from 1959 through 1966, when it was shortened to its present two weeks, was 4,700 chinook and 7,500 steelhead.

Landings during the winter season are of little value in predicting the spring chinook run, Meierjurgen said. Unpredictable weather and variation in the timing of the spring chinook run, especially of this early part of the run, prevent any useful comparison of landing figures with other years. Last year, for example, much bad weather kept fishermen off the Columbia during part of the season; more favorable weather during the recent season permitted more fishing.

Spring Season To Be Set Soon

There is less fishing intensity in winter than later in the year, Meierjurgen said. Winter season activity is centered on the lower river with little effort given to drifts above St. Helens.

A decision on the spring commercial season on the Columbia River will be determined in the latter part of April. Then, the Fish Commission and the Washington Department of Fisheries will hold a joint public hearing, and set the spring season--based on the latest available biological data.

* * *

COHO RELEASED

Some 10 million yearling coho were slated to be liberated into Oregon waters last month. Since 1958, an average 7.6 million of such young salmon (smelts) have been liberated from Oregon Fish Commission hatcheries. Of the 10 stations rearing coho, 4 are on the coast and 6 on the Columbia River.

Ernest R. Jeffries, the Commission's fish culture director, said that the Commission cannot claim all credit for excellent coho fishing, both sport and commercial, during the past few years, but it is convinced that the coho releases have given the runs a substantial boost. Good ocean survival conditions are an extremely important factor in maintaining good salmon runs, Jeffries noted.

The fish have spent their first year in fresh water and are ready to migrate to the ocean. They will remain there until the spawning urge sends them back into the rivers on the spawning run. Some smelts will return in fall 1967 as jacks, 2-year olds, but most will not return until fall 1968 as fully mature 3-year olds.

Hatchery Production Being Evaluated

This year is the first of a 2-year program to evaluate the contribution of hatchery production to the sport and commercial fisheries. Ten percent of the 10 million coho are marked with an identifying fin-clip. The same percentage of coho production in Washington hatcheries and U. S. Fish and Wildlife Service hatcheries also are marked in a Federal-state financed program to determine where and how many of their fish are harvested.

Washington

HAKE FISHERY IN
PUGET SOUND SHOWS PROMISE

Five vessels were fishing in mid-March for Pacific hake in the Port Susan area of Puget Sound, Washington. All 5 were using midwater trawls and telemetry systems designed and developed by BCF's Exploratory Fishing Base in Seattle. The vessels were delivering their catches to pet food and fish meal processors in LaConner, Bellingham, and Everett, Washington.

This seasonal hake fishery started in late November 1966 and is expected to continue until May 1967. By mid-March, over 6 million pounds had been landed. The season's total is expected to reach 12-14 million pounds. In 1966, this area's production was $6\frac{1}{4}$ million pounds.

THE SUBMARINE "PISCES" AS A FISHERIES TOOL

By William L. High*

BCF's Exploratory Fishing and Gear Research Base, Seattle, Wash., chartered the two-man submarine Pisces for 6 days in October 1966 to determine its usefulness in fisheries research. Twenty-nine dives were made to depths between 90 and 552 feet in Puget Sound, Wash. Although the ascent and descent rates were variable, an average ascent from 300 feet took 6 minutes. We observed gear performance, fish behavior, plankton distribution, and currents and found the submarine well suited for numerous research objectives.

On the negative side, visibility often was limited, the sub was unable to effectively follow a midwater trawl--and one of the most frustrating aspects of observing from a submarine was the inability to capture, identify positively, and examine the animals sighted. Scientists must soon develop suitable sampling devices, especially for those submarines with external manipulators.

The Pisces, completed in 1966, is the first f several to be constructed by the Canadian irm, International Hydrodynamics, Ltd. CF's aims in chartering it included: (1) rovide orientation dives by Bureau personnel) evaluate the suitability of small submarines r fishery investigations, (2) observe the beavior of Pacific hake (Merluccius productus) der natural conditions and the influence of hts and capturing gear, and (3) determine ether the submarine could be operated near lagic trawls.

PROCEDURES

Submarine activities were confined to ratoga Passage, a weather-protected area ithin Puget Sound, Wash., where large conentrations of hake occur. Each morning, e Pisces was lowered into the water from large barge equipped with support facilities nd towed to the nearby dive location with a)-foot power launch (fig. 1). The pilot and e first observer of the day boarded before unching and used the tow period for preve system checkout and observer orientaon. On later dives, observers were transrred while the Pisces floated on the surface.

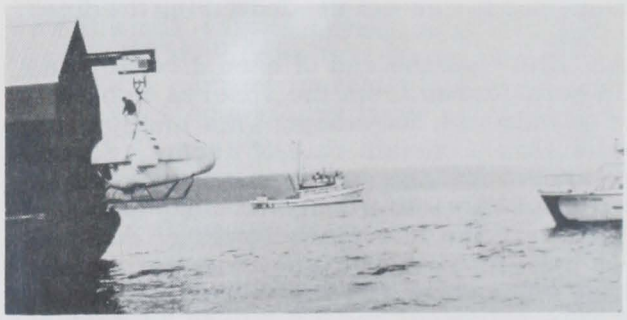


Fig. 1 - The Pisces being lowered into the water from the support barge and towed by the "Hudson Explorer" (right) to the nearby diving location. The Bureau's vessel "John N. Cobb" (center) provided additional support services.

DESCENT: The submergence procedure required about 10 minutes because buoyancy is altered by transferring oil from bladders to spheres. The sink rate is controlled by manipulating oil level within the spheres; however, the rate usually was about 30 feet per minute to permit observations of plankton layers and midwater fish species. The Pisces could readily suspend in midwater.

SUBMERGED OPERATIONS: Once the vessel was on the bottom, the equipment was

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Fish and Wildlife Service
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checked out, and oil was shifted by electric pump to provide neutral buoyancy. Fore and aft tilt of the submarine was achieved by actuating a hydraulic ram that moved the battery case along a short track.

Voice communication was maintained at all times with the launch, which homed on the voice signal using a directional transducer.

The life-support system functioned very well. The submarine interior was always dry. No headaches or other physical discomforts were experienced.

Every 45 minutes, the atmosphere was analyzed for CO_2 content and relative humidity. At no time did the CO_2 level exceed 0.9 percent. A small blower was actuated intermittently to force the air through CO_2 and moisture scrubbers. After the blower ran 5 minutes, CO_2 was reduced to less than 0.4 percent and relative humidity from 90 to 55 percent. Oxygen was introduced by a hand-operated valve. Although water temperature was 52° F., internal air temperature never dropped below 58° F. The sphere contains a heating system, but it was not needed during the dives.

ASCENT: At the end of each dive, oil was again transferred from the spheres to bladders to increase buoyancy. This method provided a slow, constant rate of ascent. A more rapid ascent could be made by also introducing compressed air into a doughnut-shaped ballast tank beneath the fiberglass cowling. Air was fed in until positive buoyancy was reached and the submarine lifted off bottom. The ascent rate increased from 0.3 to to 2.0 feet per second as the air expanded to fill the collar during the ascent. Total ascent time from 300 feet averaged about 6 minutes.

With the protective sail around the hatch opening, it was convenient to transfer personnel without lifting the submarine from the water. Observers were easily transferred to the submarine in a 1-foot chop. Observers could be exchanged, the Cardroxide CO_2 scrubber replaced, and the submarine underway again in less than 10 minutes.

The Pisces was towed back to its barge at the end of each day. Batteries were recharged overnight and other routine maintenance undertaken.

RESULTS

Twenty-nine dives were completed during the 6-day charter. Had a second pilot been available, the number of dives--or the average time per dive--could have been increased. The hours of operation depend on the amount of power used to propel the submerged submarine. The average dive was to 256 feet and for 56 minutes. However, one 2-hour dive reached 552 feet.

Weather was generally good and did not hamper activities. Low water visibility did restrict several aims. In near-surface layers, objects could be distinguished at 15 to 20 feet, but in deeper waters and near the bottom, visibility at times was reduced to 3 feet.

Several factors contributed to the Pisces' inability to effectively follow a midwater trawl towed by BCF's research vessel John N. Cobb. The magnetic compass reacted too slowly to be effective. Turns were made by varying the speeds of the two side-mounted motors. It was difficult to control a turn because of the submarine's momentum once a turn began. Heavy discharge rates on the batteries during high power maneuvers greatly restricted the running time. Available power was used up in a short time.

Twenty-two persons made dives in the Pisces. Although the primary aim of most was to familiarize themselves with the submarine and its potential use, some noteworthy observations were made: Hake, spiny dogfish (Squalus acanthias), ratfish (Hydrolagus colliei), flounders (several species), and shrimp (several species) were noted on most dives. Walleye pollock (Theragra chalcogammus), shiner perch (Cymatogaster aggregata), Pacific tomcod (Microgadus proximus), rockfishes (Sebastodes spp.), and crabs (Cancer magister) were seen less often.

Hake Not Affected By Sub Or Lights

Three dives were made near a midwater trawler that was catching up to 20,000 pounds of hake per 90-minute tow. During the first two dives, a few hake were observed near the bottom. After the sub reached bottom, all motors and lights were turned off for several minutes, then the lights were again turned on.

Apparently, hake were not affected either by the submarine or its powerful lights. On the third dive, the trawler made an echo sounding trackline directly over the submarine. The resulting echogram, as evaluated by the captain, indicated fish to be abundant from the bottom up to a distance of several fathoms, but the observer saw no hake. The pilot and observer saw numerous dogfish 25 to 30 fathoms below the surface. Near bottom, the observer saw a heavy concentration of various large plankton and a few cods, probably Pacific tomcod or walleye pollock.

During many dives, juvenile hake were found between 28 and 60 fathoms. Although they did not appear to be schooled, several often were seen at one time. These fish were about 2 to 5 inches long. The bodies appeared pink, but this may have resulted from the submarine's lights.

These hake were drifting with the tide in either a head-up or head-down attitude. Every few seconds they would assume a horizontal position and swim erratically for a short distance, stop, and return to the heads-up or down position. Those drifting close to the bottom sometimes would begin their swim and hit the bottom. These hake may have been feeding for they were seen snapping at unidentified objects.

View From The Sub

Definite phototaxis (movement of organisms toward light) was shown only by one fish species, shiner perch, on one dive to 96 feet. A large school accumulated when the Pisces settled on the bottom with its lights turned on. The school dispersed after the lights were turned off for about 3 minutes, then regrouped when the lights were turned on again. As the Pisces began ascent, the shiner perch followed to about 30 feet off the bottom.

Plankton and debris were abundant at all depths. Whenever the Pisces was stationary, plankton quickly gathered around the lights. Few distinct plankton layers were noted, but certain forms were definitely absent from some levels. During the night dive to 552 feet, larger species appeared after the sub ascended beyond 100 feet. A thicker layer of plankton and silt extended from 480 feet to the bottom.

Numerous holes were seen in the mud bottom. The smaller ones, up to about 3 inches in diameter, seemed created by marine forms other than clams; however, no animals were detected. At 552 feet, several holes about 6 inches in diameter and at least 5 inches deep were seen. No detectable activity or water currents originated from the hold, although the Pisces remained quiet for 30 minutes and lights were extinguished several times for periods up to 10 minutes. Silt and other debris carried across the bottom by strong currents probably would fill the holes within a few tidal cycles, if some animal did not clean them.

Phosphorescent activity varied between dives. Usually, it was most apparent when the darkened submarine lay on the bottom with a strong tide running. Distorted current patterns caused by the sub's presence were illuminated by the phosphorescent marine forms.

Tidal currents at 200 or more feet often were quite different from surface currents. On one occasion, an estimated $1\frac{1}{2}$-knot current flowed on the bottom while the surface was at slack water. Direction of flow sometimes was 180° from that on the surface. As the bottom current increased, silt was picked up and created a muddy layer up to 30 feet off bottom.

Modifications Could Improve Pisces' Performance

Some aspects of fishery research from Pisces-like submarines are feasible. Biological surveys can be successful, especially on rough bottom areas not suitable for conventional sampling gear. Plankton types, and their distribution within a water column, can be studied. By operating at reduced power, stays of 24 hours or more would be practical.

The Pisces now is equipped with a 1,500-pound skid. By altering or removing the skid, large instrumentation packages could be accommodated, or a third man could easily be carried within the sphere, although his vision through the viewing ports would be limited.

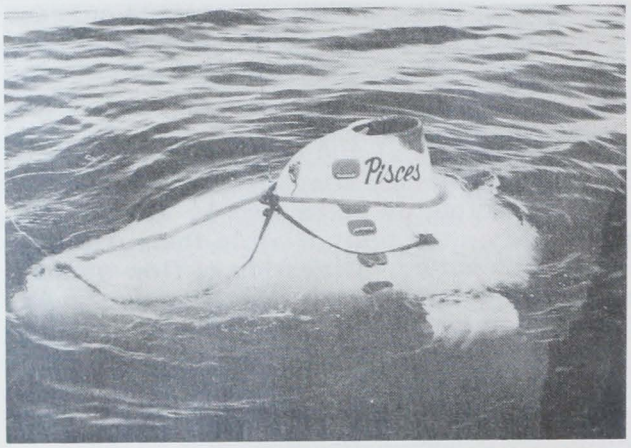
The system of buoyancy control used in the Pisces has several distinct advantages: (1) Costly weight need not be dropped after each dive, or installed before each descent;

and (2) the submarine can stop at any midwater depth, then readily rise or descend any number of times during a dive.

Additional attempts to follow trawls may be worthwhile if a gyrocompass, more precise steering, and increased speed and power are provided. Nonmobile fishing gear, such as crab pots or longlines, probably can be viewed effectively.

Equipment scheduled for future installation includes: A direct reading current meter, a depth telemetry system, gyrocompass, and an improved submarine tracking system that will operate independently of the voice communication system.

THE PISCES



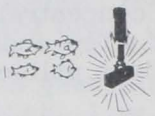
The Pisces is a two-man submarine designed to operate at depths up to 4,800 feet. The pressure sphere has an inside diameter of 76 inches, permitting ample space for pilot, observer, and more instruments. Two viewing ports situated forward give each man 130° vision ahead of the submarine. A smaller port permits a camera to be mounted permanently between the viewing ports.

The Pisces is relatively portable. Overall, it is 16 feet long, 11 feet wide and has a gross weight of about 14,000 pounds. Payload capability is about 1,500 pounds.

Present instrumentation includes echo sounder with forward and bottom transducers, magnetic compass, two external pressure gauges, submersible-to-surface voice communication, two 1,000 watt external quartz-iodide lights, internal-external thermometers, 16-mm. cine camera, and a tape recorder. For the 6 days it was chartered, a Government-owned depth telemetry system was installed.

The life support system includes Cardroxide[1/] CO_2 scrubbers, supplemental oxygen storage tank, CO_2 analyzer, humidity meter and dryer, and emergency rebreathers. Environmental endurance is calculated at 290 man-hours.

1/Trade names mentioned do not imply endorsement of commercial products.



BCF Reactivates Vessel Mortgage Insurance Program

For the first time since November 1966, when the program was forced to mark time for lack of funds, BCF is taking applications for fishing vessel mortgage and loan insurance. A notice in the "Federal Register," March 7, 1967, made public that the authorization for outstanding mortgage insurance on fishing vessels had been increased to $20 million.

The program provides for the insurance of mortgages and loans to construct, reconstruct, and rebuild vessels. The mortgage's face amount cannot be more than 75 percent of the work cost. Maturity cannot exceed 15 years, nor can the interest rate be over 6 percent.

Since the program began in 1960, $10 million have been made available to strengthen the fishing fleet.

More information may be obtained from BCF regional offices.

Interior Awards 18 Oceanography Study Grants

The Department of the Interior has awarded to 18 universities graduate educational grants totaling about $200,000. The 2-year grants, part of the National Oceanographic Program, will be available for the 1967 fall term. The universities select deserving students who are graduates or about to be graduated.

The program was started in 1962 to help evelop scientists in fishery oceanographic ubjects. Administered by BCF, the program akes $200,000 available each year. Scien-sts assist Interior Department in selecting niversities for the grants.

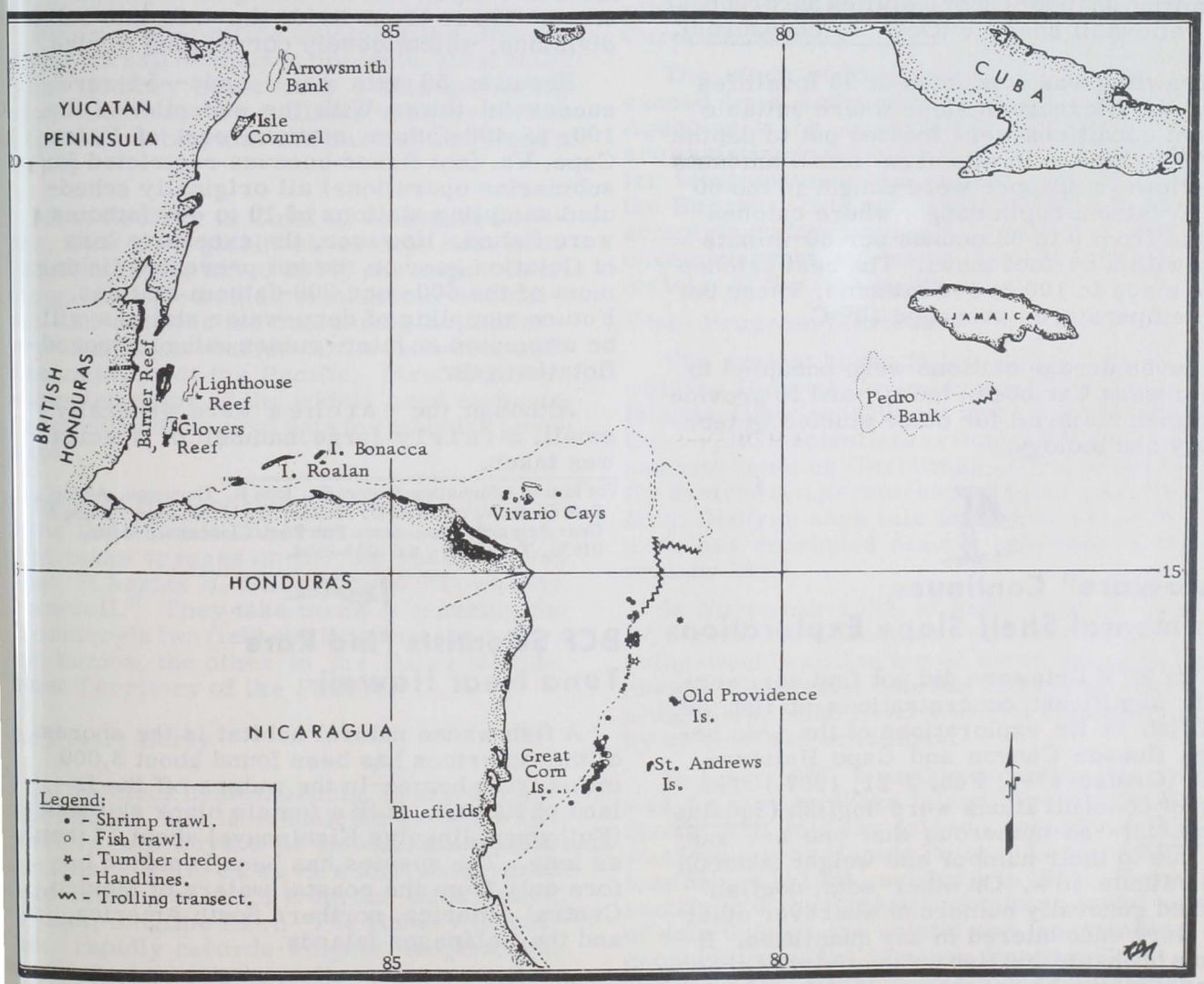
Grants were made to 12 schools in 1962, in 1963 and 1964, 18 in 1965, and to 19 in 966. Applications for the 1967 awards came om 49 institutions in 33 States.

Students apply for grants to the schools ey wish to attend. The grants provide for yment of tuition and fees and living ex-nses of $3,000 a year. Married students th children also receive a family allowance $1,000.

"Oregon" Finds Commercial Amounts of Pelagic Fish

The results of the Oregon's 39-day cruise in the western Caribbean indicate significant commercial concentrations of pelagic fishes available to conventional gear (Cruise No. 115, ended Feb. 24).

Cruise objectives were: (1) to continue seasonal exploratory fishing coverage in the western Caribbean with emphasis on trawling, trolling, handlining, and dredging off the coasts of British Honduras and Nicaragua; and (2) to cooperate with the United Nations Special Fund Caribbean Fisheries Project by providing at-sea training for observers from British Honduras, Bonacca Island, and Jamaica.



R/V Oregon pelagic fish exploratory Cruise 115.

Trawling near Vivario Cays, off Honduras and outside currently used fishing grounds, produced light catches of grooved shrimp. Nighttime catches of 6 to 13 pounds (heads-on) of pink shrimp were made per 90-minute drag with a 60-foot shrimp trawl.

Red Snapper Fishing Encouraging

Fishing for red snapper was conducted with handlines and reels off British Honduras, Honduras, and Nicaragua with encouraging results. Several species of snapper and grouper were found distributed throughout the area. The 3 most abundant were yelloweye snapper, blackfin snapper and red snapper. These species were caught on handlines. Other snapper species captured on handlines were dog snapper (Lutjanus jocu), lane snapper (Lutjanus synagris), grey snapper (Lutjanus griseus), black snapper (Apsilus dentatus), vermilion snapper (Rhomboplites aurorubens), and yellowtail snapper (Ocyurus chrysurus).

Trawling was conducted at 30 localities along the Nicaraguan slope where suitable bottom conditions were located out to depths of 158 fathoms. In this area, small amounts of yelloweye snapper were caught in the 60 to 110-fathom depth range, where catches ranged from 0 to 62 pounds per 60-minute drag with a 60-foot trawl. The best catches were made in 100 to 110 fathoms, where bottom temperatures averaged 18° C.

Eleven dredge stations were occupied to help assess Caribbean fauna--and to provide specimen material for other studies in technology and biology.

"Delaware" Continues Continental Shelf Slope Explorations

The M/V Delaware did not find commercially significant concentrations of fish or shellfish in its explorations of the area between Hudson Canyon and Cape Hatteras, N. C. (Cruise 67-1, Feb. 2-21, 1967.) The largest concentrations were dogfish (Squalus acanthias)--so numerous that one net was lost due to their number and weight taken on a 30-minute tow. On other sets, dogfish seemed generally numerous wherever other fish were encountered in any quantities. It seems probable that fish productivity of these waters might be increased if this species were removed.

Cruise 67-1 completed coverage of this area begun on Cruise 66-11 (Nov. 29-Dec. 15, 1966). The purpose of 67-1 was to determine the occurrence and abundance of fish and shellfish species available to trawl gear. Most of the survey stations originally scheduled for winter sampling have been fished. The same stations will be fished again during a future summer period (and possibly spring and fall as well) to show the changes that occur in fish abundance and seasonal availability.

Procedure: The stations sampled were arranged in transect lines extending across the slope of the bottom from near shore to deep water over the Continental Slope. The sampling stations were 10, 20, 35, 50, 75, 100, 200, and 400 fathoms along each line. Twelve transect lines were plotted between Hudson Canyon and the offing of Cape Hatteras. These lines divide the area into subdivisions, which loosely correspond in size.

Results: 59 sets were made--54 were successful tows. With the exception of the 100- to 400-fathom stations east of False Cape, Va. (not fished because restricted for submarine operations) all originally scheduled sampling stations of 10 to 400 fathoms were fished. However, the excessive loss of flotation gear on the net prevented fishing most of the 600- and 800-fathom stations. Future sampling of deep-water stations will be attempted on later cruises using improved flotation gear.

Although the catches were generally small, a fairly large number of species was taken.

For further information contact Dr. John R. Thompson, Acting Base Director, or Ernest D. McRae, Jr., Exploratory Fishing & Gear Research Base, State Fish Pier, Gloucester, Mass., 01930, Telephone: 617-283-6554.

BCF Scientists Find Rare Tuna Near Hawaii

A fish whose natural habitat is the shores of the Americas has been found about 3,000 miles from home--in the waters off the island of Hawaii. It is a female black skipjack (Euthynnus lineatus Kishinouye) about 17 inches long. The species has been reported before only from the coastal waters of Mexico, Central America, northern South America, and the Galápagos Islands.

The fish was taken by BCF's research vessel "Charles H. Gilbert" about 35 miles west

of Hawaii in a mixed school of skipjack tuna and small bigeye tuna. The discovery was made by Walter M. Matsumoto, Biologist, and I'agay Kang, Biological Technician, of BCF's Biological Laboratory, Honolulu.

Matsumoto and Kang offer 3 possible reasons for the rare catch: (1) The black skipjack is found more widely in the oceans than had been known. (2) This fish might simply be a stray from the eastern Pacific Ocean. (3) It may be that the species is beginning to spread from its known habitat.

She Casts Her Net Across The Tropical Pacific

From a quiet office adjoining the University of Hawaii campus in Honolulu, Mrs. Mary Lynne Godfrey supervises a data-gathering network that covers millions of square miles of the entire tropical and subtropical Pacific Ocean.

Mrs. Godfrey is Chief of Scientific Services, BCF Biological Laboratory, Honolulu. A staff member since 1950, she supervises young, college-trained technicians who collect and process the basic data the laboratory uses in its studies of the fisheries and oceanography of the Pacific. Mrs. Godfrey originated some of the widely used methods of recording biological data for machine processing.

Most of the laboratory's technicians work at the Dole Street Laboratory unless required to make voyages on the two research vessels: "Charles H. Gilbert" and "Townsend Cromwell." They take turns at manning the laboratory's two field stations--one in American Samoa, the other in the Palau Islands, Trust Territory of the Pacific.

They Start Early

At 5 o'clock in the morning, every day except Sunday, a BCF technician joins the fish handlers and buyers at Honolulu's two fish auctions. He measures and observes the daily catches of boats from the Oahu-based, 42-boat, longline fleet. The fishery technician rapidly records weights, lengths, and sex of the tunas and marlins. He may also draw samples of tuna blood or collect gonads or stomach contents.

At five in the evening, 5 days a week, two technicians wait at the tuna cannery at Kewalo Basin as the pole-and-line caught skipjack are unloaded and trundled in for processing. They, too, select randomly and make length, weight, and sex measurements and collect blood samples.

Early or late, whenever and wherever pelagic (ocean) fish are unloaded in any quantity, BCF has tried to be there to collect data that will further its studies. Work starts at 6 a.m. for the man stationed in American Samoa, where Japanese, Korean, and Chinese fishing boats unload their catches at two busy canneries in Pago Pago.

In April 1965, in cooperation with the Trust Territory of the Pacific Islands and the newly established fish freezing plant in Koror, Palau Islands, the laboratory started similar sampling of fish taken in that area of the Western Caroline Islands.

The study of Pacific tuna is further advanced by a knowledge of its environment. Agencies with stations all over the Pacific are assisting in the collection of surface water temperatures and salinity samples for the Bureau. This collection leads to a more complete understanding of the movements of ocean currents and water masses and, ultimately, of the fish in them.

When Program Started

The project began in late 1953. Working with the District Commissioner of the Line Islands District, Gilbert and Ellice Islands Colony, BCF scientists arranged for Gilbertese employes on Christmas Island to gather the desired temperatures and water samples. Mrs. Godfrey says this important set of records has continued almost unbroken to the present time.

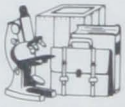
In November 1955, at Koko Head on Oahu, BCF Honolulu Laboratory employes began a twice-weekly collection of water samples for chemical analysis. Lke the water at all sampling sites, Koko Head water is characterized by open-ocean conditions.

In early 1957, a weekly sampling program was begun on Wake Island, French Frigate Shoals, and Midway Island. Johnston Island was followed by Manele Point on Lanai, American Samoa in 1961, and Guam in 1962. From each island, the Bureau is obtaining useful sets of data through the helpful and longstanding cooperation of the Weather Bureau, Coast Guard, Navy, Departments of Agriculture of both Guam and the Government of American

Samoa, and the Hawaii Division of Fish and Game.

In addition to data from sampling sites on land, BCF uses material from two ocean weather stations. The Weather Bureau and the Coast Guard have made possible the collection of daily surface water temperatures and weekly water samples from Weather Stations Victor (34°00' N., 164°00' E.) and November (30°00' N., 140°00' W.).

Under Mrs. Godfrey's supervision, millions of items of data collected from this wide area are standardized and punched on cards for machine analysis by specially trained operators.



Their Road Show Abroad Stars Fish

When they appeared in London the first time, on January 18, 1966, one British agent representing one U. S. firm was on hand. When they returned February 14, 1967, that agent was working for 4 U. S. firms--and there were 4 other agents, each representing a U. S. firm, and still others seeking to take on U. S. fishery products.

Between the 2 dates, the members of BCF's Office of International Trade Promotion (OITP), Sam Hutchinson, A. L. "Gus" Morel, and L. F. "Nip" Reynolds, had staged their shows in Italy, Austria, Germany, and France.

OITP travels abroad to expand the markets for existing U. S. fishery products--and to promote new products. Their showcases consist of high-quality frozen and canned fishery products conveniently packaged. Included are such species as Alaska king crab, whitefish caviar, shrimp, lobsters, lisa, salmon, pasteurized crabmeat, and squid.

So far, the program has concentrated on Western Europe because that area is enjoying a rising standard of living. European visitors to the fairs have warmed to the processed, packaged, and convenient fishery products. These products have shown that they can compete for the housewife's attention and money. For many housewives, serving a lobster dinner, shrimp as hors d'oeuvre, or some other gourmet items reflects the new prosperity.

U. S. exhibitors have learned that there is a burgeoning market for American fishery products.

Fig. 1 - "Incroyable!" The expression on the face of this leading French importer says: "Incredible". He was looking at the display of fresh fish, a subordinate part of the exhibit, at Pompano, Spanish mackerel, mullet, swordfish, ocean trout, and scallops. He added: "Unique! How can they be so fresh?"

The cool man on the far left is Sam Hutchinson, Head of the Office of International Trade Promotion.

Program Aids Small U. S. Firms

OITP works with the U. S. Department of Agriculture to participate in the fairs. USDA handles the background work--survey of area, time of fair, location--and invites between 2,000-3,000 top tradesmen in the host and neighboring countries. These include importers, brokers, distributors, agents, and institutional operators.

The International Food Trade Fairs have provided U. S. firms their largest audiences at the least expense. The U. S. processor has only to send his product and pay the freight and duty on the samples he ships. The OITP provides a display booth, audience of top trade people, advertising, and personnel to coordinate the promotional efforts. The OITP specialist assists the foreign importer in preparing inquiries and passes them on to U. S. firms able to quote prices and supply the items.

If the small U. S. firm worked alone, the cost of just renting space and paying the dec-

Fig. 2 - U. S. frozen fishery products at U. S. Trade Center Exhibition, London, England. Tempting American fish products were shown in 6 of these deep freeze units and upright cases. Sampled by the visitors were such tasty products as king crab, scallops, shrimp, lobsters, fish wieners, chub fillets, stuffed flounder, smelt, seafood baskets, crab sticks, and shrimp burgers.

Fig. 3 - U. S. frozen fishery products at the U. S. Trade Center Exhibition, February 14-23, 1967, London. English importers saw, tasted, and ordered American fishery products that were attractively displayed, high in quality, and competitive in price. Shown here in BCF's display cabinets are Alaska king crab, breaded fantail shrimp, dungeness crab, shrimp (individually quick frozen), and Maine lobsters.

orator, electrician, and staff would amount to $1,500 to $2,500. By working through OITP, his bill is about one tenth this figure. It is a real good deal to promote his company's product abroad.

The Box Score

To date, 10 fairs have produced nearly one million dollars in sales for U. S. firms. The OITP staff projects a figure twice this amount as a result of these efforts. Some firms have sold the bulk of their seasonal inventory; in two instances, the demand was so large that it could not be met. After a sale of 150 tons of shrimp in London, orders for an additional 50 tons of shrimp and 5 tons of king crab had to await later delivery.

The fairs also are an ideal meeting place for U. S. firms seeking trained foreign agents, and vice versa. They give the U. S. exporter a chance to carry on business face to face. In London, over 80 importers, buyers, and agents signed registration sheets expressing interest in U. S. products and asking for more information. Many of these persons desire to represent U. S. firms.

Meatless Frank Makes Appearance

At the Milan (Italy) Trade Center, 12 U. S. firms supplied 30 different species of frozen, canned, and processed fishery products. Some were known to the Italian market--frozen squid, shrimp, and king crab meat. Others were new--carp roe from the Great Lakes, caviar made from whitefish, canned lobster morsels, canned lisa, canned codfish cakes, frozen chub fillets, and Maine lobsters frozen by a liquid nitrogen process. But the hit was a frankfurter made entirely of freshwater fish. It looked like, tasted like, and was eaten like a meat wiener.

While the frankfurt was a smash in Milan and London, it moves this month to its toughest audience--the one in Frankfurt, Germany.

WATER: THE VITAL ESSENCE

"Three-quarters of the earth's surface is covered by a compound about which man has known very little until recently. Whether falling as spring rain, racing by as a mountain stream, or lying still and black in the Marianas Trench, water has generated, surrounded, and supported life as we know it. More and more, it is becoming the key to new physical knowledge about the planet.

"Water: The Vital Essence," by Peter Briggs (232 pp., printed, $5.95 a copy. Harper and Row, Publishers, Inc., 49 East 33rd Street, New York, N. Y. 10016) "provides a broad picture--an introduction to the global sea and the freshwater rivers flowing into it, the submarine rivers which move beneath its surface, and the expanding science of oceanography. It offers the layman a review of what is known about underwater geology--the unseen landscape--origins of life on land, the sea as a potential source of energy and food. The reader is also faced with society's very real problems of maintaining an adequate supply of usable fresh water, a subject of tremendous importance for a geometrically increasing population. Everybody can't live upstream."

FEDERAL ACTIONS

Corps of Engineers

DENIES DREDGE PERMIT IN FLORIDA

On March 14, the U. S. Corps of Engineers denied a permit for dredging and filling in Boca Ciega Bay, Florida. The Corps decision was based on the harmful effects of the proposed operation on fish and wildlife resources and the public interest--and its inconsistency with the purposes of the Fish and Wildlife Coordination Act and the Florida Board of Conservation.

The "St. Petersburg Times" cites the decision as a landmark. It is the first time that concern for fish and wildlife resources has been the basis for denying a permit. Before, the Corps of Engineers concerned itself primarily with the effects of dredging and filling on navigation.

Department of Health, Education, and Welfare

FDA WILL REQUIRE MORE PRECISE PACKAGE LABELING

The Food and Drug Administration has proposed regulations requiring every food package to state clearly and exactly "how much" and "what" the customer is buying ("The Federal Register," March 17, 1967). The regulations were formulated under the 1966 Fair Packaging and Labeling Act (PL 89-755) effective July 1, 1967.

The regulations would ban such misleading words as "jumbo quart" or "full gallon."

They would require:

- Listing the form in which a food is offered--"whole, slices, diced, etc.".
- Expressing quantities in pounds and ounces, or in gallons, quarts, pints, and fluid ounce subdivisions.
- Labeling packages containing less than four pounds in both ounces and pounds and fractions of pounds or ounces. Example: "A declaration of $1\frac{1}{2}$ pounds weight shall be expressed as "net wt. 24 oz. (1 lb. 8 oz.)," "net wt. 24 oz. ($1\frac{1}{2}$ lb.)," or "net wt. 24 oz. (1.5 lb.)."

A package of less than one gallon would be labeled in the largest whole quart or pint; the remainder would be given as a fraction or in fluid ounces.

- Listing ingredients under their common or usual name "in order of decreasing predominance" (in order of amounts).
- Accompanying any statement of the number of servings by the quantity of each serving--"in terms of weight, measure, or numerical count."
- Outer containers, such as "six-packs," to bear the mandatory label information for the product.
- The name and address of the "manufacturer, packer, or distributor" to appear on the "principal display panel" of the package.

Treasury Department

CUSTOMS DETERMINES USSR NOT DUMPING FISHERY PRODUCTS

A tentative determination was made by the U. S. Treasury Department that shrimp, lobster tails and lobsters, fresh frozen or cooked frozen, imported from the Soviet Union, are not now nor are likely to be sold at less than fair value within meaning of Antidumping Act of 1921. (Published in "Federal Register," January 31, 1967.)

In March 1966, the Treasury Department was informed that imported Soviet fishery products were being sold at less than fair value. To check this, the Bureau of Customs began an inquiry based on provisions of the Customs Regulations. Also, it published an Antidumping Proceeding Notice in the "Federal Register," April 19, 1966.

Checked Purchase Price and Constructed Value

The determination was based on evidence that, for fair value purposes, the appropriate bases for comparison are purchase price and the constructed value of the imported Soviet shrimp. Customs found that the purchase prices of shrimp were in no instance lower than their constructed value.