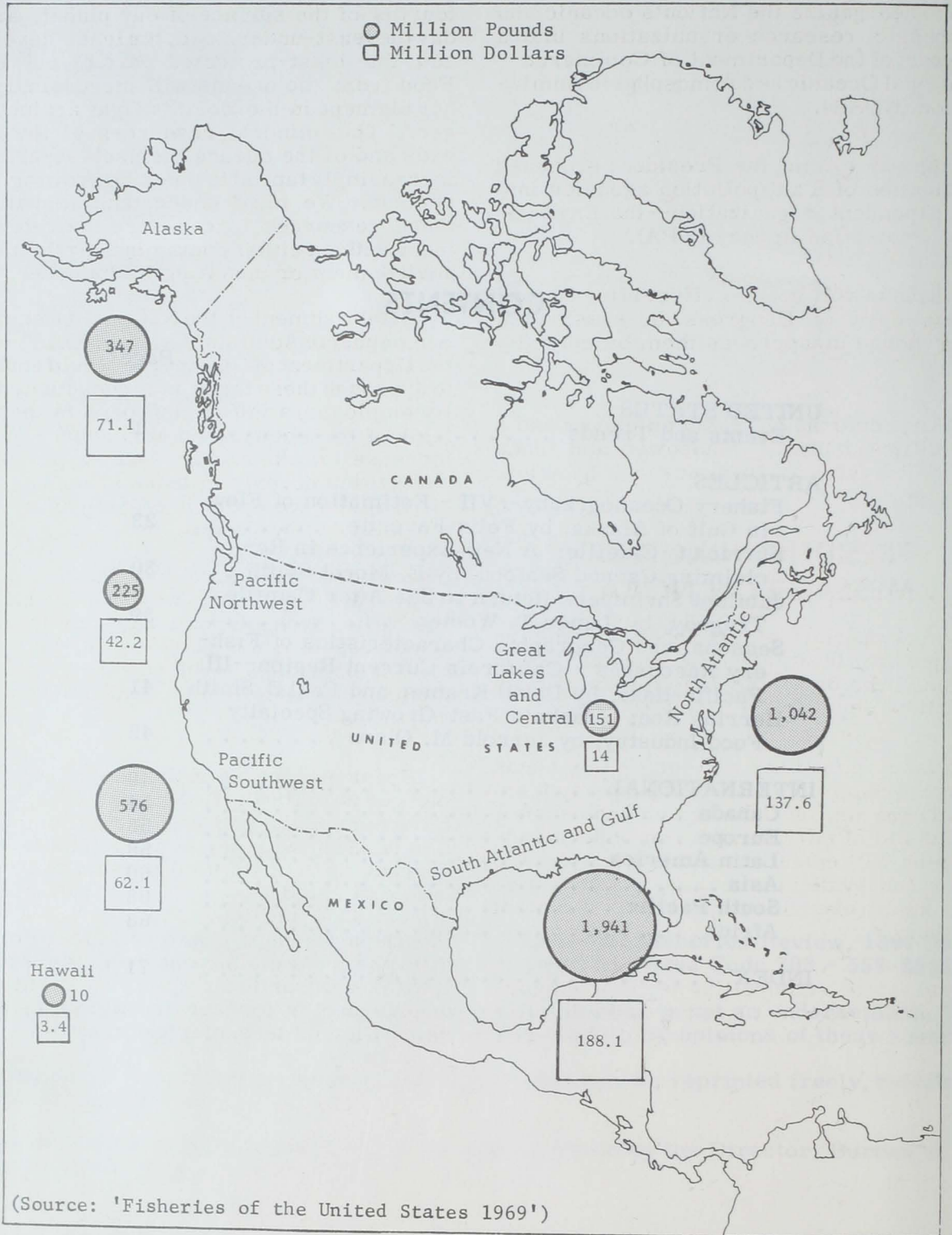


VOLUME & VALUE OF CATCH BY REGIONS, 1969



NIXON PROPOSES NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

President Nixon sent to Congress on July 9 a plan to reorganize the Nation's oceanic and atmospheric research organizations into a single part of the Department of Commerce--the National Oceanic and Atmospheric Administration (NOAA).

At the same time, the President proposed consolidation of 8 antipollution agencies into one independent organization--the Environmental Protection Agency (EPA).

Both plans will go into effect after 60 consecutive days of Congress in session--if either house disapproves them by majority vote.

NOAA would have 12,000 employees and a \$100-million budget. Manpower and funds could be transferred from several agencies. (See page 3.)

PRESIDENT NIXON'S MESSAGE ON NOAA

The oceans and the atmosphere are interacting parts of the total environmental system in which we depend not only for the quality of our lives, but for life itself.

We face immediate and compelling needs for better protection of life and property from natural hazards, and for a better understanding of the total environment--an understanding which will enable us more effectively to monitor and predict its actions, and ultimately perhaps to exercise some degree of control over them.

We also face a compelling need for exploration and development leading to the intelligent use of our marine resources. The

global oceans, which constitute nearly three-fourths of the surface of our planet, are today the least-understood, the least-developed, and the least-protected part of our earth. Food from the oceans will increasingly be a key element in the world's fight against hunger. The mineral resources of the ocean beds and of the oceans themselves, are being increasingly tapped to meet the growing world demand. We must understand the nature of these resources, and assure their development without either contaminating the marine environment or upsetting its balance.

Establishment of the National Oceanic and Atmospheric Administration--NOAA--within the Department of Commerce would enable us to approach these tasks in a coordinated way. By employing a unified approach to the problems of the oceans and atmosphere, we can increase our knowledge and expand our opportunities not only in those areas, but in the third major component of our environment, the solid earth, as well.

Scattered through various Federal departments and agencies, we already have the scientific, technological and administrative resources to make an effective, unified approach possible. What we need is to bring them together. Establishment of NOAA would do so.

By far the largest of the components being merged would be the Commerce Department's Environmental Science Services Administration (ESSA), with some 10,000 employees (70 percent of NOAA's total personnel strength) and estimated Fiscal 1970 expenditures of almost \$200 million. Placing NOAA within the Department of Commerce therefore entails the least dislocation, while also placing it within a Department which has traditionally been a center for service activities in the scientific and technological area.

These are the principal functions of the programs and agencies to be combined:

The Environmental Science Services Administration (ESSA) comprises the following components:

- The Weather Bureau (weather, marine, river and flood forecasting and warning).
- The Coast and Geodetic Survey (earth and marine description, mapping and charting).
- The Environmental Data Service (storage and retrieval of environmental data).
- The National Environmental Satellite Center (observation of the global environment from earth-orbiting satellites).
- The ESSA Research Laboratories (research on physical environmental problems).

ESSA's activities include observing and predicting the state of the oceans, the state of the lower and upper atmosphere, and the size and shape of the earth. It maintains the nation's warning systems for such natural hazards as hurricanes, tornadoes, floods, earthquakes and seismic sea waves. It provides information for national defense, agriculture, transportation and industry.

ESSA monitors atmospheric, oceanic and geophysical phenomena on a global basis, through an unparalleled complex of air, ocean, earth and space facilities. It also prepares aeronautical and marine maps and charts.

Bureau of Commercial Fisheries and marine sport fish activities. Those fishery activities of the Department of the Interior's U.S. Fish and Wildlife Service which are ocean related and those which are directed toward commercial fishing would be transferred. The Fish and Wildlife Service's Bureau of Commercial Fisheries has the dual function of strengthening the fishing industry and promoting conservation of fishery stocks. It conducts research on important marine species and on fundamental oceanography, and operates a fleet of oceanographic vessels

and a number of laboratories. Most of its activities would be transferred. From the Fish and Wildlife Service's Bureau of Sport Fisheries and Wildlife, the marine sport fishing program would be transferred. This involves five supporting laboratories and the ships engaged in activities to enhance marine sport fishing opportunities.

The Marine Minerals Technology Center is concerned with the development of marine mining technology.

Office of Sea Grant Programs. The Sea Grant Program was authorized in 1966 to permit the Federal Government to assist the academic and industrial communities in developing marine resources and technology. It aims at strengthening education and training of marine specialists, supporting applied research in the recovery and use of marine resources, and developing extension and advisory services. The Office carries out these objectives by making grants to selected academic institutions.

The U.S. Lake Survey has two primary missions. It prepares and publishes navigation charts of the Great Lakes and tributary waters and conducts research on a variety of hydraulic and hydrologic phenomena of the Great Lakes' waters. Its activities are very similar to those conducted along the Atlantic and Pacific coasts by ESSA's Coast and Geodetic Survey.

The National Oceanographic Data Center is responsible for the collection and dissemination of oceanographic data accumulated by all Federal agencies.

The National Oceanographic Instrumentation Center provides a central Federal service for the calibration and testing of oceanographic instruments.

The National Data Buoy Development Project was established to determine the feasibility of deploying a system of automatic ocean buoys to obtain oceanic and atmospheric data.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

The following agencies will be brought into NOAA--which will be in the Department of Commerce--if Congress does not object to President Nixon's reorganization plan:

FROM DEPARTMENT OF THE INTERIOR

1. Bureau of Commercial Fisheries (BCF)
2. Marine sport fish activities of Bureau of Sport Fisheries and Wildlife (BSFW)

BCF and BSFW now make up The Fish and Wildlife Service.

3. Marine Minerals Technology Center of the Bureau of Mines

FROM DEPARTMENT OF DEFENSE

1. Great Lakes Survey of the Army Corps of Engineers
2. National Oceanographic Data Center of the Navy Department
3. National Oceanographic Instrumentation Center of the Navy Department

FROM DEPARTMENT OF TRANSPORTATION

Data buoy development activities of the Coast Guard

FROM NATIONAL SCIENCE FOUNDATION

The program of grants to academic institutions for research in marine resources and technology.

ALREADY IN COMMERCE DEPARTMENT

The ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION (ESSA) remains in Commerce Department--but is shifted to NOAA.

Role of NOAA

Drawing these activities together into a single agency would make possible a balanced Federal program to improve our understanding of the resources of the sea, and permit their development and use while guarding against the sort of thoughtless exploitation that in the past laid waste to so many of our precious natural assets. It would make possible a consolidated program for achieving a more comprehensive understanding of oceanic and atmospheric phenomena, which so greatly affect our lives and activities. It would facilitate the cooperation between public and private interests that can best serve the interests of all.

I expect that NOAA would exercise leadership in developing a national oceanic and atmospheric program of research and development. It would coordinate its own scientific and technical resources with the technical and operational capabilities of other government agencies and private institutions. As important, NOAA would continue to provide those services to other agencies of government, industry and private individuals which have become essential to the efficient operation of our transportation systems, our agriculture and our national security. I expect it to maintain continuing and close liaison with the new Environmental Protection Agency and the Council on Environmental Quality as part of an effort to ensure that environmental questions are dealt with in their totality and that they benefit from the full range of the government's technical and human resources.

Authorities who have studied this matter, including the Commission on Marine Science, Engineering and Resources, strongly recommended the creation of a National Advisory Committee for the Oceans. I agree. Consequently, I will request, upon approval of the plan, that the Secretary of Commerce establish a National Advisory Committee for the Oceans and the Atmosphere to advise him on the progress of governmental and private programs in achieving the nation's oceanic and atmospheric objectives.

An On-Going Process

The reorganizations which I am here proposing afford both the Congress and the Executive Branch an opportunity to re-evaluate the adequacy of existing program authorities involved in these consolidations. As these two new organizations come into being, we may well find that supplementary legislation to perfect their authorities will be necessary. I look forward to working with the Congress on this task.

In formulating these reorganization plans, I have been greatly aided by the work of the President's Advisory Council on Executive Organization (the Ash Council), the Commission on Marine Science, Engineering and Resources (the Stratton Commission, appointed by President Johnson), my special task force on oceanography headed by Dr. James Wakeelin, and by the information developed during both House and Senate hearings on proposed NOAA legislation.

Many of those who have advised me have proposed additional reorganizations, and it may well be that in the future I shall recommend further changes. For the present, however, I think the two reorganizations transmitted today represent a sound and significant beginning. I also think that in practical terms, in this sensitive and rapidly developing area, it is better to proceed a step at a time--and thus to be sure that we are not caught up in a form of organizational indigestion from trying to rearrange too much at once. As we see how these changes work out, we will gain a better understanding of what further changes--in addition to these--might be desirable.

Ultimately, our objective should be to insure that the nation's environmental and resource protection activities are so organized as to maximize both the effective coordination of all and the effective functioning of each.

The Congress, the Administration and the public all share a profound commitment to the rescue of our natural environment, and to the preservation of the Earth as a place both habitable by and hospitable to man. With the acceptance of these reorganization plans, the Congress will help us fulfill the commitment



BCF PROVIDES INFORMATION TO TROPICAL TUNA FLEET

Initial efforts toward extending BCF fishery advisory information to the tropical tuna fleet were completed during May, according to Dr. Michael Laurs, Group Leader, BCF La Jolla. Several San Diego-based purse seiners have sailed or are planning to sail to areas beyond the yellowfin regulatory area set up by the Inter-American Tropical Tuna Commission (IATTC). One group of 6 or 7 vessels plans to fish as far west as Truk and Palau.

For the most part, says BCF La Jolla, fishermen are unfamiliar with the oceanographic and fishing conditions they may expect to find outside the traditional fishing grounds in the eastern tropical Pacific. The American Tunaboat Association (ATA) asked BCF to provide information on oceanography, weather, and tuna resources that may help fishermen decide on areas most likely to have fish.

Dr. Laurs Prepares Synopsis

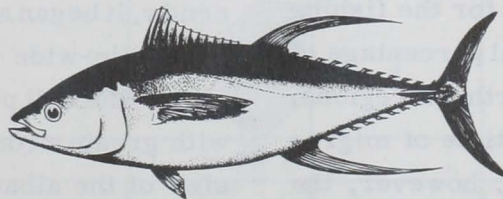
Dr. Laurs prepared a synopsis of what is known about tuna resources in the central and western tropical Pacific. It was based on records of exploratory cruises made mainly by BCF Hawaii and on Japanese catch data. This information was included in a packet of

data distributed to fishermen. The packet also included charts of sea-surface temperature, mixed layer depth, seabird and mammal sightings, information on weather, especially tropical storms, and sea conditions, and what weather advisory information is available over the marine radio bands for various regions in the central and western Pacific."

Also, arrangements were made with Tom Chase of Scripps Institution of Oceanography for BCF to print and distribute copies of unpublished bathymetric charts containing the most up-to-date and complete information.

Meet With Tunaboat Captains

On May 10, Dr. Laurs and R. Green of BCF and F. Miller of IATTC met with about 15 tunaboat captains and A. Felando of ATA to brief them and to present the information gathered. Also, Mr. Miller, under an IATTC contract with BCF, will provide special weather advisory information through ATA to the vessels as needed. XBT systems were installed and probes provided for two more vessels in the tropical tuna fleet. Each vessel has agreed to radioback synoptic BATHY reports and synoptic marine weather observations on a daily basis.



Yellowfin Tuna

ALBACORE TUNA CATCH OF 26-40 MILLION POUNDS PREDICTED

BCF La Jolla, Calif., estimates that 26 to 40 million pounds of albacore tuna will be landed in Oregon, Washington, and British Columbia this year. Between 11 and 15 million pounds will be landed in California. These estimates are based on current trends and historical analysis. "It would appear that the albacore fishery will be centered again this year in waters off the Pacific Northwest," says BCF La Jolla. This prediction is based on: warmer-than-average ocean temperatures in waters off the Pacific Northwest; position of 60° F isotherm offshore; and historical record of landings.

Albacore Prefer 60-66° F

The high correlation between the catch of albacore tuna and sea-surface temperature shows species seems to prefer temperatures in 60-66° F range. Historically, most albacore taken off California have been caught in waters 62-66° F; highest catches in 64° F.

Average sea-surface temperature in areas from which albacore were taken in July and August was about 62° F; for albacore caught in September, it was about 60° F. So reports Oregon State University. No commercial quantities of albacore were taken from waters off Pacific Northwest colder than 58° F, or warmer than 64.5° F.

Analysis of available information points strongly to an excellent start for the fishing season. A larger-than-normal percentage of the catch will be taken in northern regions. Present knowledge of arrival time of migrating population is inadequate; however, the probability of a northerly fishery suggest an

early availability of fish in waters off Pacific Northwest.

1969 Landings

The Pacific west coast albacore landings in 1969 were 51 million pounds. This was somewhat higher than 1960-1968 average of 46 million pounds. The statistical variance in landings for 1960-1969 period is about 1 million pounds. According to 1960-1969 average, an estimation of 37-55 million pounds could be landed this year.

1970 Estimates

If Oregon, Washington, and British Columbia receive up to 75% of total west-coast landings, as in past 3 years, then California will receive 10-14 million pounds, and region to north 27 to 41 million pounds. If both regions receive 50% of total landings, then each will receive 18 to 28 million pounds. BCF La Jolla estimates 11 to 15 million pounds may be landed in California; 26-40 million pounds could be landed in Oregon, Washington, and British Columbia.

BCF La Jolla emphasizes that its projections of landings "are based on historical trends and our best estimates of the fishery. Without essential biological data for albacore we are in a difficult position to make meaningful long-term (seasonal) projections having the desired accuracy and substance." Recently, it began a study of albacore biology on a Pacific-wide basis. It hopes that in about a year this will provide "the ability to predict with greater confidence the abundance and size of the albacore population which enters the fishery along our coast each summer."

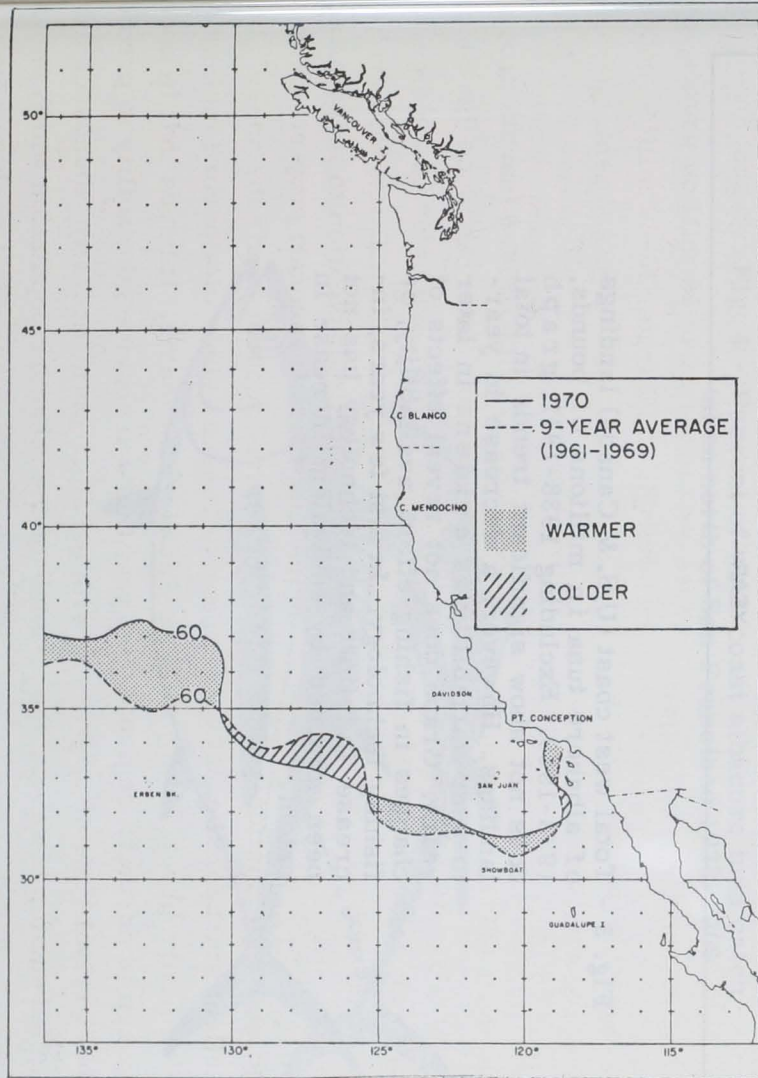


Fig. 1 - Relation of position of May 16-31, 1970, 60° F limiting isotherm to long-term average position for the same interval.

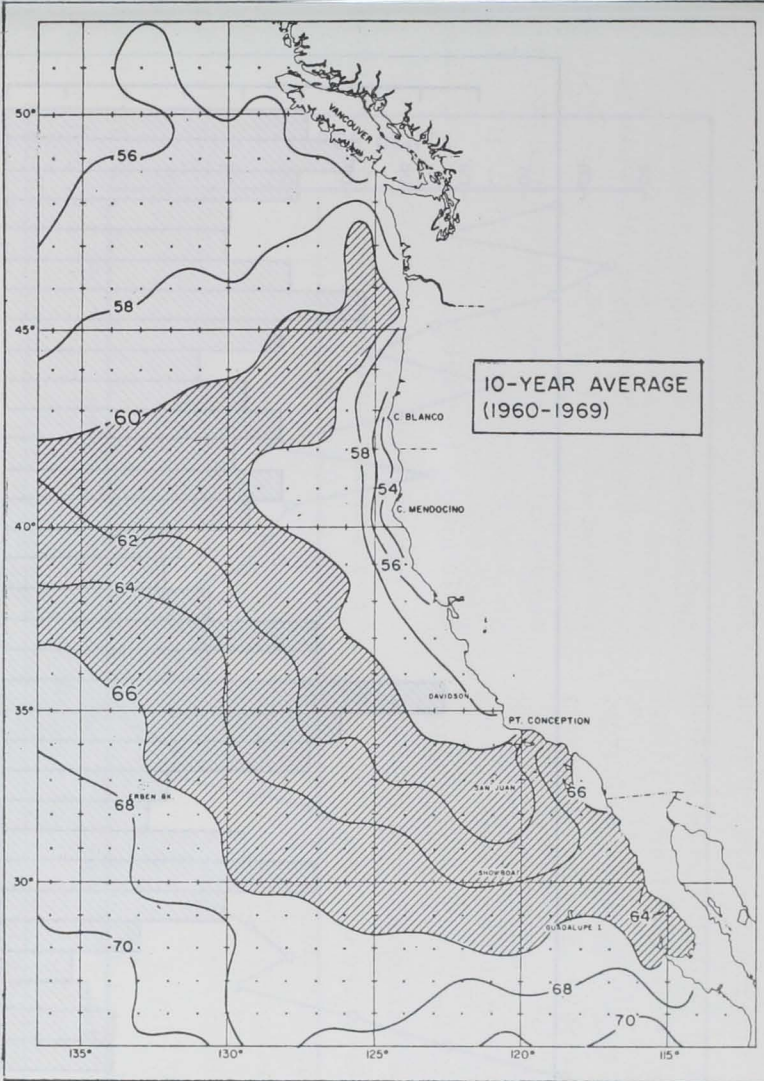


Fig. 2 - Average sea surface temperature fields for the July 1-15 interval. Shaded zone delineates region where most of the albacore would be available under these conditions.

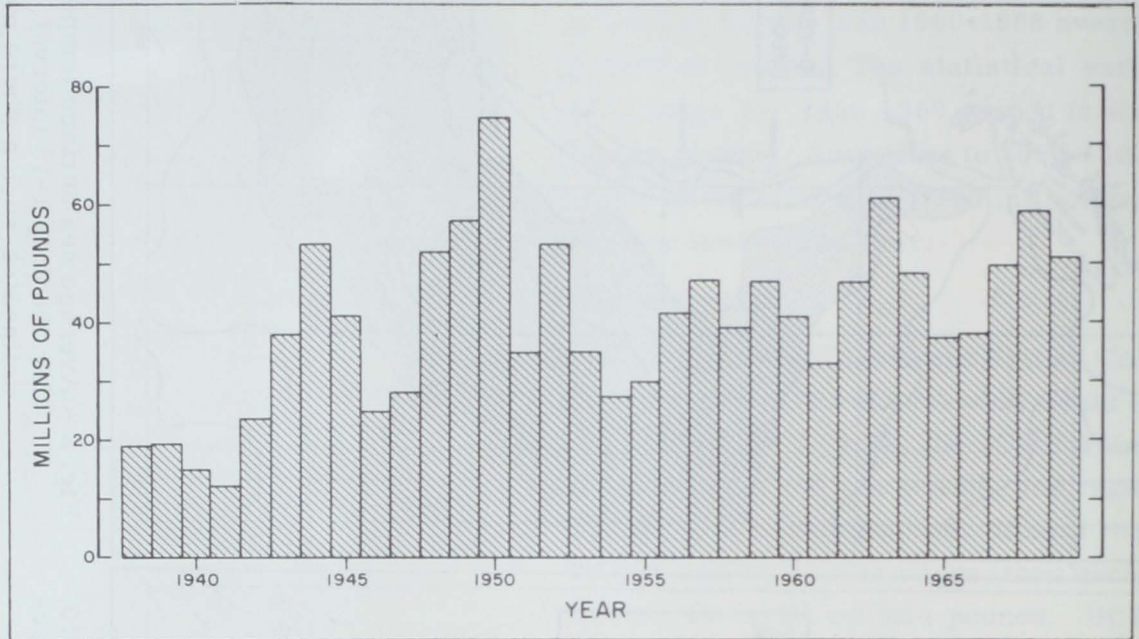


Fig. 3 - Total west coast (U.S. & Canada) landings of albacore tuna in millions of pounds, 1938-1969. Excluding 1938-1941, graph does not show significant trends in total landings. However, a decrease in year-to-year variability is evident in later years. Graph does not reveal effects of changes in fishing effort, availability, or fishing technology. In last few years, increase in effort and technology has not been matched by equivalent increase in catch.

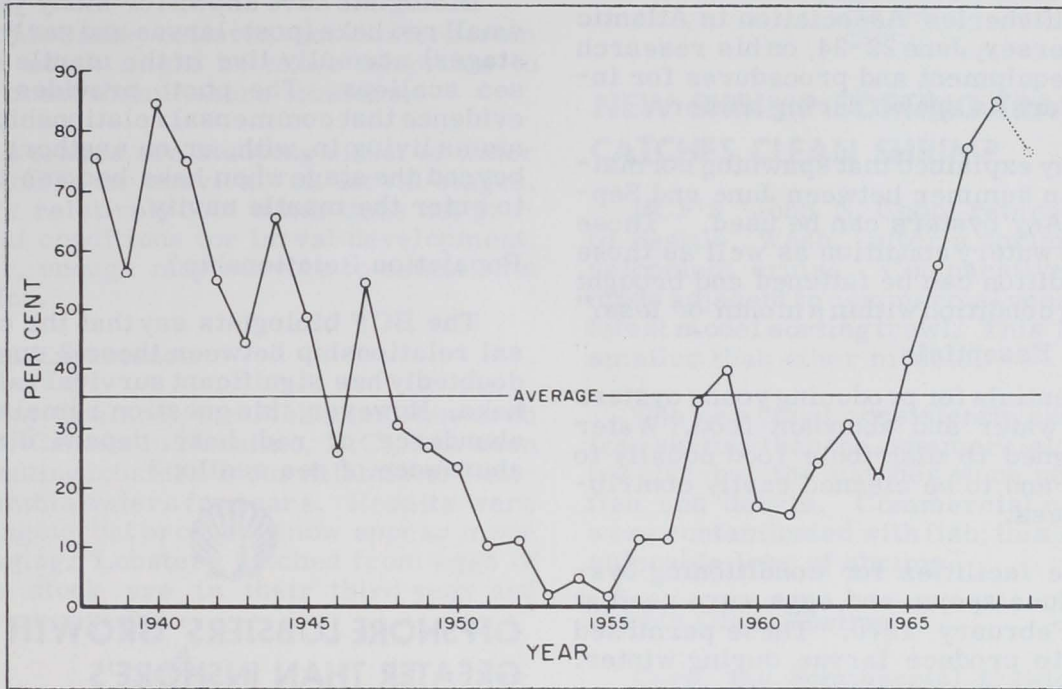
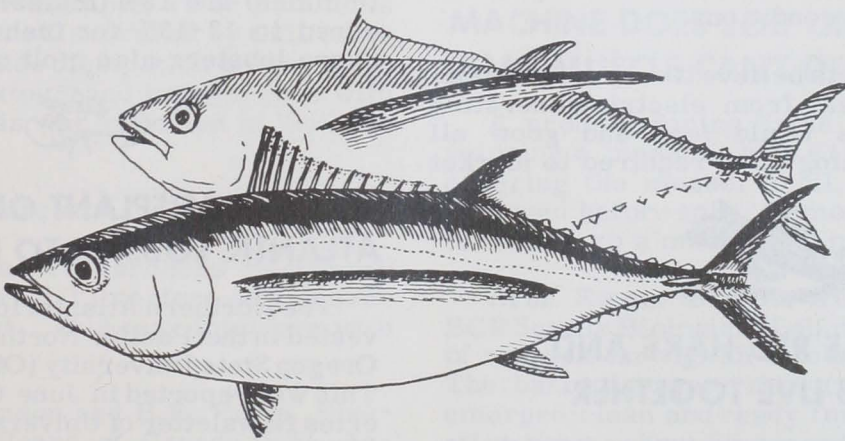


Fig. 4 - Percent of west coast albacore tuna catch taken north of San Francisco 1938-1969.



WINTER OYSTER SPAWNING TECHNIQUE DEVELOPED AT VIMS

Dr. John L. Dupuy of the Virginia Institute of Marine Science (VIMS) reported to the National Shellfisheries Association in Atlantic City, New Jersey, June 22-24, on his research to develop equipment and procedures for inducing oysters to spawn during winter.

Dr. Dupuy explained that spawning normally occurs in summer between June and September. "Any oysters can be used. Those in weak and watery condition as well as those in good condition can be fattened and brought to spawning condition within a month or less."

Production Essentials

The essentials for producing young oysters are warm water and abundant food. Water tanks designed to distribute food equally to each oyster and to be cleaned easily contribute to success.

Adequate facilities for conditioning oysters to produce sperm and eggs were used at VIMS in February 1970. These permitted scientists to produce larvae during winter.

Water Temperature's Role

Scientists believe that oysters spawned, carried through larval development, and raised through young-oyster stage under controlled conditions are ready to be placed on growing grounds when water temperatures are high enough for them to feed actively. In this way, they may reach market size 18 months earlier than under natural reproducing and growing conditions.

Some scientists believe it may be possible to use waste heat from electric generating plants. Oysters would feed and grow all winter--shortening time required to market them.



POST-JUVENILE RED HAKE AND SEA SCALLOPS LIVE TOGETHER

A photo taken by biologists of BCF Woods Hole (Mass.) laboratory aboard the 'Albatross IV' shows a 12-inch red hake snuggled against a sea scallop in its natural habitat on the sea bottom. The photo was taken at a water depth

of 210 feet on Georges Bank, 125 miles east of Cape Cod, Mass.

First Evidence

Biologists have known for many years that small red hake (post-larvae and early juvenile stages) normally live in the mantle cavity of sea scallops. The photo provides the first evidence that commensal relationships (organisms living in, with, or on another) continue beyond the stage when hake become too large to enter the mantle cavity.

Population Relationship?

The BCF biologists say that the commensal relationship between these 2 species undoubtedly has significant survival value to the hake. However, this question remains: Does abundance of red hake depend directly on abundance of sea scallop?



OFFSHORE LOBSTERS' GROWTH RATE GREATER THAN INSHORE'S

The recapture of 5100 offshore lobsters tagged by scientists of BCF Boothbay Harbor (Maine) has provided much information on their increase in size at molting and the frequency of molting.

Offshore lobsters 60 to 80 millimeters carapace length increase in length by 17% (females) and 19% (males) at molting--compared to 12-13% for inshore lobsters. Offshore lobsters also molt more frequently.



STUDY TRANSPLANT OF NORTHERN ATLANTIC LOBSTER TO PACIFIC

The Northern Atlantic lobster may be harvested in the Pacific Northwest, if studies at Oregon State University (OSU) are successful. This was reported in June Commercial Fisheries Newsletter of University of Rhode Island (URI).

Capt. James McCauley, lobster trawler and URI professor of fisheries, has shipped adult berried females and adult males

to OSU for study. These lobsters were trawled by 'Jerry and Jimmy' in offshore waters.

Offshore Lobsters for Oregon

Capt. McCauley believes that lobsters from offshore stock might be more adaptable to Oregon coast than inshore lobsters.

OSU workers are studying effect of water temperature on survival of larval stages. Oregon's relatively cold water does not provide ideal conditions for larval development. However, enough may survive to establish a population.

Canadian Experience

Dr. Ray Ghelardi, the Fisheries Research Board of Canada in Nanaimo, B.C., has been transplanting lobsters from Atlantic to British Columbia waters for years. Results were discouraging, but prospects now appear more encouraging. Lobsters hatched from eggs of Atlantic stock are in their third year and weigh over a pound.



DDT MAY INTERFERE WITH ADAPTABILITY OF TROUT

Scientists have become more concerned with once-unsuspected, subtle biological effects of environmental contaminants at sublethal levels. For example, water pollutants at legal levels were discovered by California researchers to cause dissipation of energy in flies and zooplankton--and interference with reproduction. This was reported in 'Science News' on May 9.

Canadian Trout Research

Two Canadian researchers discovered sublethal levels of DDT interfere with learning in brook trout. This may interfere with their adaptability.

Dr. J.M. Anderson and H.B. Prins, Fisheries Research Board of Canada in St. Andrews, N.B., exposed brook trout to 20 parts per million (ppm) of DDT for 24 hours. Then they subjected the fish to classical conditioning of the propeller-tail reflex.

A control group was conditioned in an average of 29 trials. Ten DDT-exposed fish could not be conditioned even after 100 trials; another 6 required an average of 76 trials.



NEW SHRIMP-SORTING TRAWL CATCHES CLEAN SHRIMP

BCF's 'John N. Cobb' returned recently to Seattle, Wash., after a shrimp-trawl development cruise. Comparative tows were made adjacent to commercial vessels with the latest model sorting trawl. This is about 25% smaller than other models.

The new trawl consistently caught 15-25% less shrimp than the commercial non-sorting trawls--but the catches were nearly free of fish and debris. Commercial catches often were contaminated with fish; this caused considerable loss of shrimp.

Cobb's Clean Shrimp

Once, the commercial trawler 'Jaka-B' caught 1,900 pounds of shrimp mixed with trash; the Cobb caught 1,500 pounds of clean shrimp. The Jaka-B Crew recovered only about 200 pounds of shrimp; all of Cobb's 1,500 pounds were high quality.



MACHINE DOES JOB ON MUSSEL THAT MUSCLE CAN'T DO CHEAPLY

A problem facing firms interested in developing a mussel industry is barnacles covering the mussel shell. These must be removed before sale. Removal by hand costs too much, so a mechanical method is needed.

Arne Einmo and Dr. Tim Joyner of the BCF Seattle Biological Laboratory ran a batch of mussels through an electric potato peeler. The barnacles were removed. The mussels emerged clean and ready for market. Operation time: about 55 seconds.



HATCHERIES ARE IMPROVING U. S. FISHING

Fish hatcheries have been used since the Civil War, but they did not become an effective tool to improve U.S. fishing until 1950. The chief difference was selective stocking. There were many stocking failures before 1950 because rearing and planting fish were inexact sciences.

'New Look' in Hatcheries

The "new look" of the 1950s and 1960s has come from evaluating species, their needs, and environmental conditions under which they would most likely survive. Other hatchery improvements are better diets, more research on control of diseases and parasites, better water in rearing ponds, and better brood stock to provide healthier fish.

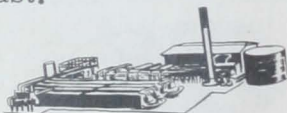
U.S. Facilities

"Today, managers of Federal facilities weigh environmental situations before attempting to stock fish," says Dr. Leslie L. Glasgow, Assistant Secretary of the Interior for Fish and Wildlife and Parks. "The idea is to plant fish where they will best thrive."

The 100 hatcheries operated by Interior's Bureau of Sport Fisheries and Wildlife (BSFW) are concerned largely with waters on Indian lands, national parks and forests, military reservations, and public reservoirs. Waters are stocked where native fish are not sport species, or where game species do not occur in sufficient numbers.

Warm- & Cold-Water Species

Warm-water and cold-water species--catfish to salmon--are raised in hatcheries, which benefit commercial and sport fishermen. Pacific salmon and steelhead trout from Northwestern facilities help maintain West Coast sport and commercial fisheries. A hatchery in Maine helps to reestablish runs of Atlantic salmon in streams along New England coast.



ANADROMOUS FISH CONSERVATION PROGRAM GETS MORE BENEFITS

The Nation's anadromous fishes--salmon and other species that ascend streams and rivers from the sea to spawn--are getting increased benefits from a 4-year extension which began July 1, of the Anadromous Fish Conservation Act of 1965.

Congress has authorized appropriations of \$6 million for fiscal year 1971, \$7.5 million for 1972, \$8.5 million for 1973, and \$11 million for 1974--a total of \$32 million dollars, \$7 million more than was provided over the past 4 years.

U.S. Share Up to 60%

Under the new program, the Federal share of project costs can be increased from 50% to a maximum of 60% when two or more States with a common interest in any basin enter into an agreement with Secretary of the Interior Walter J. Hickel.

The program is administered by both agencies of the Fish and Wildlife Service--the Bureau of Sport Fisheries and Wildlife, and the Bureau of Commercial Fisheries.

Commissioner's Statement

Commissioner for Fish and Wildlife Charles H. Meacham, said: "Man has polluted the streams and estuaries, built impassable barriers, and generally damaged the environment of anadromous fish. Their abundance has been sharply reduced and some entire runs have been destroyed. Federal-State cooperation is helping to reduce losses, develop new runs, and increase existing stocks in some areas."

Great Lakes Species Included

The Anadromous Fish Conservation Act applies to anadromous species and to those Great Lakes fish that ascend streams to spawn. These include Atlantic salmon, species of Pacific salmon, shad, striped bass, Dolly Varden, Arctic char, cutthroat trout, steelhead trout, sheefish, river herring, and 3 species of sturgeon.



FPC IS AVAILABLE TO HOUSEWIVES

"Instant Protein," the first food-grade fish protein concentrate (FPC) to be approved by the U. S. Food and Drug Administration, is on the market.

The manufacturers, Alpine Geophysical Associates, say they are marketing it first in New York and New Jersey supermarkets, and then will expand into New England.

Instant Protein

The FPC is a light-colored powder in half-ounce envelopes, 8 in a package. Alpine says its product has only the faint aroma of fresh fish. When blended with foods, it does not add a fish flavor and fortifies them with animal protein at a small cost per serving.

Consumer testing showed that Instant Protein blends well with flour products--bread, cakes, rolls, and cookies--and with rice products. Mixed with these items at about 10% level, it produces virtually no change in basic cooking characteristics. With most of these products, only a slightly intensified color is noticeable.

Alpine says that the powder, added to a basic spaghetti sauce, can produce meat-type sauce stock that would provide about half of a person's daily need of animal protein for about 6 cents.



BCF TO PROMOTE U.S. FISHERY PRODUCTS AT WORLD FOOD FAIR

In cooperation with U. S. Department of Agriculture, BCF will return to Brussels, Belgium, this fall to introduce U. S. fishery products at the 2nd International Food Industry Fair, Sept. 2-7. It will be BCF's 25th participation in Western European food fairs.

U.S. Industry Invited

U. S. producers and processors of fishery products are invited to attend. Such firms are not required to send representatives because BCF personnel will coordinate activities. Floor space, adequate display cabinets, and interpreter services will be provided free.

For More Information

Information may be obtained from Office of International Trade Promotion, Bureau of Commercial Fisheries, 1801 N. Moore St., Room 401, Arlington, Va. 22209. Telephone: area code 703, 557-4731.



EDA AIDS FISHERIES IN HOMER, ALASKA

The Economic Development Administration has approved a \$213,000 grant and a \$123,000 loan to help develop port and fisheries facilities and to create 52 new jobs in the City of Homer, Kenai Peninsula, Alaska. Homer is providing \$90,000 to complete the \$426,000 project.

Port Improvements

The funds will be used to extend an existing 130-foot dock by 150 feet and add a pier for mooring seagoing vessels. The improvements will provide a port for the Coast Guard vessel 'Ironwood'. A 250-vessel fishing fleet depends on it for marine protection and ice breaking.

Allow Sea Shipments

The improvements also will allow shipment of seafood products by water instead of overland, and provide needed anchorage for oceangoing freighters and tankers (now these are diverted to other ports for berths).



ERRATA - CFR MAY 1970

1. Who put snap in snapper? It wasn't BCF Technological Laboratory in Seattle, Wash., as stated on p. 62. It was BCF Technological Laboratory in Pascagoula, Miss. The work was done by Harold C. Thompson and Mary H. Thompson.
2. "United Kingdom to Abandon Fathom Measurement," p. 50. One fathom equals 1.83 meters (not 0.914 a meter).

--Frank G. Morera

STUDY SALMON'S VULNERABILITY TO MIDWATER TRAWLING

BCF's largest research vessel, the 215-foot 'Miller Freeman', returned to Eureka, California, on May 9 after a 3-day cruise to investigate the vulnerability of salmon to midwater trawling (Cruise F70-2). The cruise was a response to growing concern over the impact midwater trawling in salmon-producing areas by Soviet and Japanese stern trawlers off U.S. could have on west-coast salmon stocks. Soviet experts have said often that they do not believe in harvesting salmon on the high seas; also, that salmon are taken rarely in their fishery for hake and rockfish off U.S.

Objectives

The cruise's primary objective was to determine vulnerability of chinook and silver salmon to Soviet-type midwater trawling tactics in 2 situations: when fishing specifically in salmon concentrations, and when fishing on hake schools in areas where salmon are concentrated.

Operations Area

The operation was conducted from Eureka because fishermen in recent years have reported Soviet vessels fishing in May off northern California where salmon were concentrated. Also, interviews with troll salmon fishermen on the day before departure (May 5) indicated salmon were concentrated in Eel Canyon area between Eureka and Cape Mendocino, about 15 miles off shore.

Silvers (cohos) were taken in "blue water" from surface to 10 fathoms. Chinooks were found from 8 to 20 fathoms in "brown water". Fishing was conducted in area north and south of Eel Canyon (approximately 40° 40' N) from 8 to 20 miles off shore.

Vessel Description

The Miller Freeman is rigged as a stern trawler. She is powered by a 2,150-hp diesel engine driving a single controllable pitch propeller. She is smaller, but has slightly more horsepower, than the Soviet 'Mayakovskiy' stern trawlers (215 versus 270 feet), the dominant class of Soviet stern trawler off U.S. The Freeman was capable of as much or more towing power than Soviet trawlers. She was

equipped with two resolution echo sounders operating at 38 and 100 kHz, which were used for locating concentrations of organisms in midwater.

Gear

The two midwater trawls fished were the 'Cobb' 648 pelagic trawl and the Mark I Universal trawl. The 648 trawl was constructed of 2½-inch mesh and had a fine mesh liner in the last 12 feet of cod end. The 648 trawl is symmetrical with 116-foot headrope, footrope and breastlines; it gives a design opening of about 68 feet square. It was towed with double bridles and spread with 7-by 12-foot V-doors weighing about 2,000 pounds each.

The Mark I Universal trawl, also constructed of 2½-inch mesh, had a fine mesh liner in cod end. The headrope and footrope are both 121 feet long with breastlines of 63 feet. A 30-by 50-foot opening has been achieved when towed at around two knots. The Mark I was principal gear used in 1967 hake fishery; it has caught over 50 tons on several occasions. This trawl was rigged with three bridles and the V-doors mentioned previously.

Both trawls were towed with 5/8-inch electromechanical cable. A pressure-sensitive electrical, depth-telemetry system was used to determine trawl depth during fishing. Telemetry transmitters were positioned at each door. Also, on first tow a wireless netsonde was used to monitor trawl opening and presence of fish below, within, and above trawl. The echo-sounding side of this system operates at 200 kHz with information being telemetered back to vessel at 50 kHz. A receiving hydrophone was towed from port side and connected to a readout unit in pilot house.

Methods

Prior to midwater trawling, salmon trawlers in Eureka area were interviewed to determine areas and depths of major salmon concentrations. During operation, trawlers were contacted via marine radio to insure that Freeman operated in greatest salmon concentrations.

When in a reported salmon area, midwater trawling was conducted at depths salmon were

caught by commercial troll fleet. Trawling also was conducted in scattering layers located with echo sounder. Over 3-day period, trawling was scheduled to cover all hours of day and night.

The fishing procedure was to set trawl at reduced power and allow the gear to settle to desired depth before applying towing power. Trawling speeds were varied from $2\frac{1}{2}$ to $5\frac{1}{2}$ knots. This corresponded to power settings of one-quarter to full power. Catches were enumerated. All salmon were identified, sexed, measured, and pertinent biological data collected. Also, a representative sample of hake was measured and examined.

RESULTS

18 hauls were made during 3 days. The trawl was fished 17 hours and towed 65 nautical miles. Depths of tows ranged from surface to 43 fathoms.

Only 17 salmon--all chinooks (*Oncorhynchus tshawytscha*)--weighing total of 41 pounds were captured; the best haul yielded 8 fish. The fish ranged from 13 to 29 inches and up to 8 pounds. Although schools of coho salmon (*O. kisutch*) were sighted in area prior to trials, none was seen or captured. On day Freeman caught the 17 salmon, the commercial troller 'Kristy' in same area caught 217 salmon, 117 legal size.

Besides salmon catches, most common catches were hake (*Merluccius productus*) and squid (*Loligo opalescens*). The salmon were feeding extensively on squid.

Gear Failures

Gear failures plagued cruise from very beginning. These resulted from large strains caused by trawling at high speeds.

Conclusions

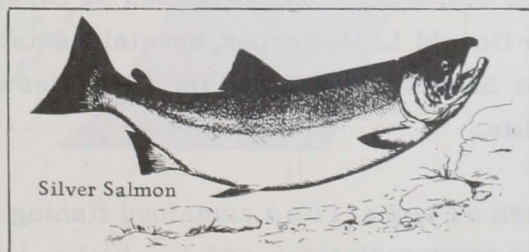
The results were inconclusive. Catches were disappointingly small. This may have been due to: fish not concentrated in areas or at depths where fishing was conducted; fish present in concentrations but avoided net; or, gear not fishing properly.

The salmon were not schooling well. Schools were not detected either visually or with fish-finding echosounders. Trawls were not fished in scattering layers judged characteristic of hake; this could explain low catches of hake. Scattering layers fished were probably "feed" (plankton) because considerable numbers of euphausiids were enmeshed in trawl wings.

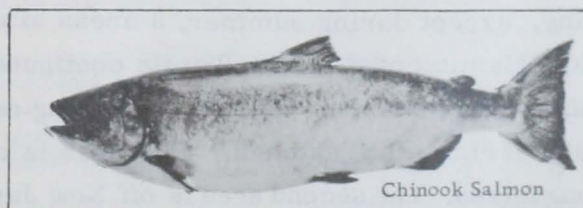
The 7- by 12-foot V-doors were too large for Mark I Universal trawl. Due to large door size, greater than normal spreading forces were exerted on net. This was apparent from large horizontal wire angles of trawl warps during fishing. Also, there was only minimal amount of chain on trawl wings. The combination of these two factors may have resulted in a reduced vertical opening, which could have affected catches.

It is difficult to trawl from Freeman at high speed with type of net used. Drag on net increases at about the square of the speed. This results very rapidly in large drag forces at high towing speeds. The use of larger meshes forward in the net would reduce drag. But it is still doubtful that speeds could be increased very much more than those obtained.

For further information contact: A.T. Pruter, Acting Base Director, Exploratory Fishing and Gear Research Base, 2725 Montlake Boulevard East, Seattle, Washington 98102 (Phone: 583-7729).



Silver Salmon



Chinook Salmon

U.S. AND POLAND SIGN FISHERIES AGREEMENT

The United States and Poland signed in Washington on June 13 an agreement on fisheries off the U.S. Middle Atlantic coast. The agreement extends and modifies an agreement originally concluded on June 12, 1969, in Warsaw, that protected scup, flounder, and hake--species important to U.S. sport and commercial fishermen. The latest agreement continues and expands protection for those species. It also broadens the protective measures to cover black sea bass, menhaden, and river herring. U.S. scientists agree that fishing of these resources should be limited.

Poland Will Refrain

Poland will not fish those species along Middle Atlantic coast and will avoid depleting them throughout the year.

Poland will continue to refrain from fishing during winter months in specified offshore area of Middle Atlantic--roughly between the 50-100 fathom zone, where bottom species concentrate early in the year. The effective period of this provision had been extended 15 days under the new agreement to apply from January 1 through April 15.

3 Loading Zones

In return, Polish fishermen will continue using, except during summer, 3 areas along mid-Atlantic coast within 9-mile contiguous fishing zone of the U.S. for unloading and transferring fish catches. One area is off Long Island. The second area is off New Jersey, south of Atlantic City. The third is off Virginia, north of Chesapeake Bay. No fish-

ing by Polish vessels is allowed within U.S. contiguous fishing zone.

Port Entry

Each Government will continue to provide for entry of a certain number of fishing and supply ships into certain ports of the other country. In return for Polish cooperation in conserving species of special concern to U.S. fishermen, U.S. facilitation of entry by Polish fishing vessels into certain U.S. ports was broadened.

Fishery Research Cooperation

The Agreement provides for cooperation in fishery research designed to improve future conservation programs in the Middle Atlantic.

Provision is made for visits of fishery representatives and inspectors to each other's fishing vessels in the Middle Atlantic.

The Agreement will remain in force through September 30, 1971.

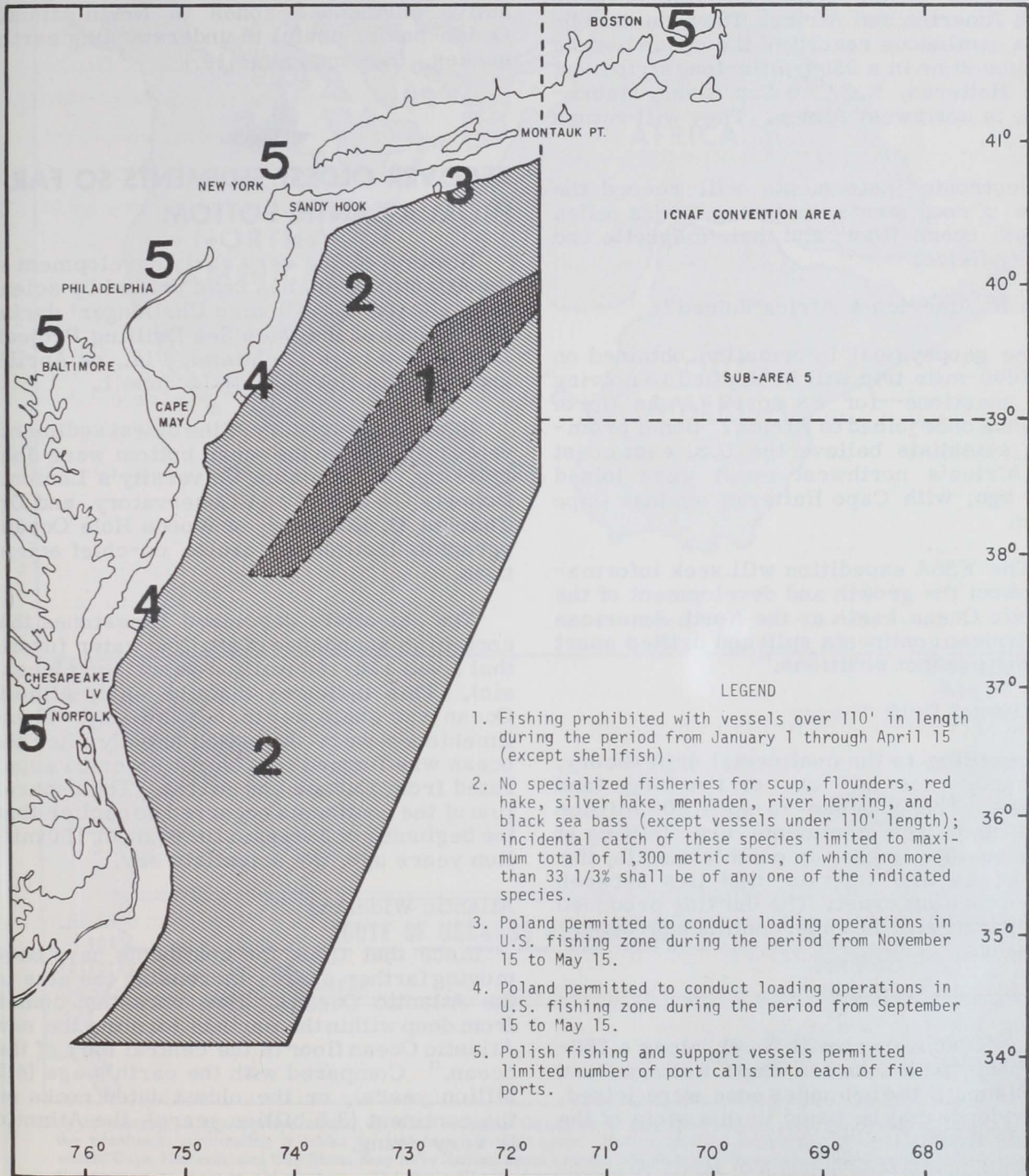
The Polish delegation was led by Vice-Minister Romuald Pietraszek, Ministry of Shipping.

The U.S. delegation was headed by Ambassador Donald L. McKernan, Special Assistant to the Secretary of State for Fisheries and Wildlife.

Both delegations contained fishing industry representatives and technical advisors.

U.S. - POLAND FISHERIES AGREEMENT

effective June 13, 1970



OCEANOGRAPHY

SEEK EVIDENCE THAT NORTH AMERICA & AFRICA ONCE WERE JOINED

ESSA oceanographers aboard the 'Discoverer' left Miami, Florida, on July 7 to probe the bottom of the North Atlantic between North America and Africa. They plan to obtain a continuous record of the ocean bottom and subbottom in a 3500-mile-long strip from Cape Hatteras, N.C., to Cap Blanc, Mauritania, in northwest Africa. They will return Sept. 17.

Electronic instruments will record the shape of rock strata, including layers miles beneath ocean floor, and their magnetic and gravity fields.

Were N. America & Africa Joined?

The geophysical information obtained on the 7000-mile trip will be applied to solving vital questions--for example, was North America once joined to Africa? Some prominent scientists believe the U.S. east coast and Africa's northwest coast were joined eons ago, with Cape Hatteras against Cape Blanc.

"The ESSA expedition will seek information about the growth and development of the Atlantic Ocean basin as the North American and African continents split and drifted apart to their present positions."

Continental Drift Theory

According to the continental drift theory, the earth once had one or two large land masses. These began to split 200 million years ago. The continents are drifting at about an inch a year in earth's mantle, the part of earth's interior that lies between molten core and crust. The drifting produced the separation of the supercontinent or supercontinents.

Discoverer's Track

The Discoverer will work along a 250-mile-wide path between Cape Hatteras and Cap Blanc. If the two capes once were joined, the evidence may be found in this strip of the ocean's floor.

The expedition will gather data on the nature of rock structures of deep sea bed. Such

information is essential to understand how ocean floor was formed--and to assess geologic formations associated with mineral and oil deposits.

Geophysical information will be sought on active earthquake zones in North Atlantic Ocean basin, useful in understanding earthquakes. (See map page 19.)



RECOVER OLDEST SEDIMENTS SO FAR FROM ATLANTIC BOTTOM

History of the very early development of the Atlantic Ocean has been probed by scientists aboard the 'Glomar Challenger' during Leg Eleven of the Deep Sea Drilling Project. Leg Eleven began in Miami, Fla., on April 8 and ended in Hoboken, N.J., June 1.

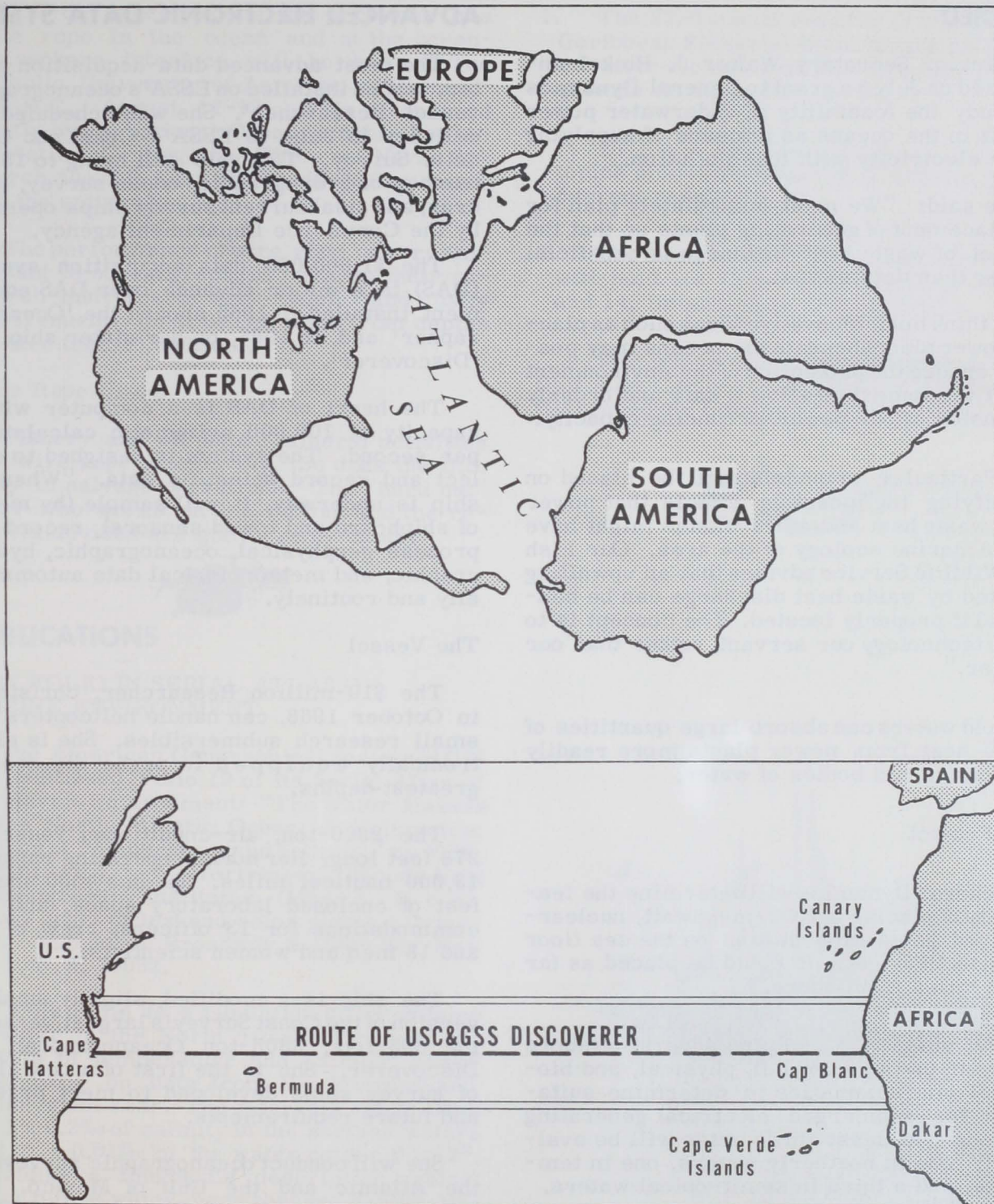
Reporting recovery of the oldest sediments yet obtained from the ocean bottom were John I. Ewing, of Columbia University's Lamont-Doherty Geological Observatory, and Dr. Charles D. Hollister, of Woods Hole Oceanographic Institution, cruise co-chief scientists.

The scientists described limestones that contain an abundance of shallow water fossils that lived 150-160 million years ago (Jurassic). This indicates that the early Atlantic Ocean was shallower than it is today. These limestones were deposited shortly after the ocean was formed--as North America separated from Europe and Africa. The separation of the continents occurred no earlier than the beginning of Jurassic time, about 180 million years ago, the scientists say.

Atlantic Widening

Since that time, the continents have been moving farther apart--increasing the size of the Atlantic Ocean. "New rock that comes from deep within the earth is forming the new Atlantic Ocean floor in the central part of the ocean." Compared with the earth's age (4.5 billion years), or the oldest dated rocks on the continent (3.5 billion years), the Atlantic is very young.





Top of drawing is interpretive sketch of North Atlantic Ocean as it may have existed some 200 million years ago after the continents surrounding it broke up and began to drift apart. Bottom drawing depicts the 250-mile-wide area across which Cape Hatteras and Cap Blanc may have drifted apart and the USC&GS Ship Discoverer's route as she seeks some of the answers to the age-old mystery. The ship will spend two months this summer probing the bottom of the sea between the two continents.

UNDERWATER POWER PLANTS STUDIED

Interior Secretary Walter J. Hickel announced on July 3 a grant to General Dynamics to study the feasibility of underwater power plants in the oceans as a means of supplying more electricity with less pollution.

He said: "We must immediately plan for the placement of generating plants so that the impact of waste heat discharge is beneficial rather than detrimental.

"I think bold, innovative ideas such as placing power plants beneath the oceans may possibly ensure the protection of the environment and at the same time allow a safe and orderly expansion of our power-producing capacity.

"Particular emphasis will be placed on identifying the possible effects that power plant waste heat and other wastes might have on the marine ecology of the area. Our Fish and Wildlife Service advises that an upwelling created by waste heat discharge can be beneficial if properly located. The concept is to make technology our servant, rather than our master."

Cold waters can absorb large quantities of waste heat from power plants more readily than can inland bodies of water.

The Project

General Dynamics will determine the feasibility of placing a 1000-megawatt, nuclear-powered generating station on the sea floor down to 250 feet. It could be placed as far as 25 miles from shore.

The study will examine several offshore sites for their geological, physical, and biological characteristics to determine suitability for submerged electrical generating stations. At least three sites will be evaluated: one in northerly waters, one in temperate, and a third in semitropical waters.



'RESEARCHER' WILL HAVE MOST ADVANCED ELECTRONIC DATA SYSTEM

The most advanced data-acquisition system will be installed on ESSA's oceanographic vessel 'Researcher'. She was scheduled for delivery in June to ESSA's Coast and Geodetic Survey. The ship will bring to 15 the number of hydrographic, ocean survey, wire drag, and tidal current survey ships operated by the Commerce Department agency.

The \$1,000,000 data-acquisition system (DAS) is a major advance over DAS equipment installed in 1965 aboard the 'Oceanographer' and, in 1967, on her sister ship, the 'Discoverer'.

The heart of DAS is a computer with a capacity of 100,000 arithmetic calculations per second. The system is designed to collect and record scientific data. "When the ship is underway, it will sample (by means of shipboard and towed sensors), record and process geophysical, oceanographic, hydrographic, and meteorological data automatically and routinely."

The Vessel

The \$10-million Researcher, christened in October 1968, can handle helicopters and small research submersibles. She is electronically equipped to probe the ocean's greatest depths.

The 2800-ton, air-conditioned vessel is 278 feet long. Her normal operating range is 13,000 nautical miles. She has 4000 square feet of enclosed laboratory space, and accommodations for 13 officers, crew of 54, and 18 men and women scientists.

The ship is a modified, slightly smaller version of the Coast Survey's largest vessels, the 303-foot, 3805-ton Oceanographer and Discoverer. She is the first of a new class of survey ships developed to meet present and future requirements.

She will conduct oceanographic surveys in the Atlantic and the Gulf of Mexico. Her home port will be Miami, Fla., site of ESSA's Atlantic Oceanographic and Meteorological Laboratories; initially, she will operate out of ESSA's Atlantic Marine Center in Norfolk, Va.



WORKSHOP ON MARINE WIRE ROPE

A 3-day workshop on the problems of a wire rope in the ocean and at the ocean-atmosphere interface will be held at The Catholic University of America in Washington, D.C., August 11-13. It is sponsored jointly by the National Oceanographic Instrumentation Center, the Office of Naval Research, the U.S. Navy Ship Systems Command, and the university.

The performance of wire rope is very important to oceanographers because their research instruments are complex and costly and frequently must be retrieved from depths greater than 10,000 feet.

Wire Rope Users

Fishery and off-shore mineral activities use wire rope extensively. So does the U.S. Navy in salvage operations. The "hard hat" diver who works on the bottom and the retrieval devices are got there by cable.



PUBLICATIONS

NEW FOLIO IN SERIAL ATLAS OF MARINE ENVIRONMENT

The American Geographical Society (AGS) has published Folio 19 of its Serial Atlas of the Marine Environment: "The Water Masses of the North Atlantic Ocean; A Volumetric Census of Temperature and Salinity," by W.R. Wright and L.W. Worthington, Woods Hole Oceanographic Institution (Mass.). It contains 8 pages of text and color plates. Price: \$10. AGS is at Broadway & 156th St., New York, N.Y. 10032.

"This Folio is a tabulation of the volume of water in the North Atlantic Ocean by intervals of temperature and salinity, based principally on data from the International Geophysical Year. The intervals range from $2^{\circ}\text{C} \times 0.2\text{‰}$ of salinity in the surface waters to $0.1^{\circ} \times 0.01\text{‰}$ in the water colder than 2° , providing a fine-scale description against which future water mass changes can be discerned."



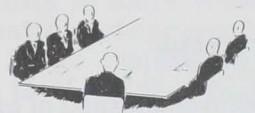
MEETINGS

1. The 23rd annual meeting of the Gulf and Caribbean Fisheries Institute will be held at the Inter-Continental Hotel, Curacao, Netherlands Antilles, Nov. 8-12, 1970.

Of the 4 sessions, 2 will be devoted to topics of specific interest; 2 will emphasize current research.

2. The International Game Fish Conference will hold its 15th annual meeting, Nov. 13 and 14, immediately after Institute.

For information: Executive Secretary, Gulf and Caribbean Fisheries Institute, 10 Rickenbacker Causeway, Miami, Fla. 33149.



CRABBING MAY BE INEXPENSIVE SPORT

"Checked the price of crab meat lately?," asked the Texas Parks and Wildlife Department in June. The Department had--and suggested this cheaper way to obtain crab meat:

Unless your wallet makes a large, uncomfortable bulge in your hip pocket, a gander at the cost of picked meat will probably kill your craving for crab à la king.

But there is an alternative to plunking down hard cash for this saltwater delicacy--catch the crabs yourself.

True, hard cash is needed for equipment, but it doesn't take much money, and the equipment can be used again and again. And the money you spend gets some extra mileage by being spent for two things, recreation and food, instead of just for food.

Handlining for Crabs

The most common method of catching crabs is by handlining. A piece of meat tied to a strong string, a dip net, and a bucket or tow sack to keep the crabs in is all that is needed; a modest layout of cash indeed.

The meat is lowered into the water. When a crab tugs on it, the line is pulled upward slowly with the crab hanging on, and the net is used to dip out the crab.

Trotlining By Serious Crabbers

Trotlining is a method used by more serious crabbers. A line with several pieces of meat dangling from strings is tied between two poles. The bait is visited periodically, and the crabs are scooped up with a net.

Crab nets and wire crab pots (traps) are also used. The pots cost from \$3 to \$5 depending on size and construction, but the average crabber does not care to make this investment. Since the use of crab pots usually takes the sport out of crabbing, most crabbers stick to less sophisticated methods.

The Right Bait?

The right bait to use is a debatable question among crabbing enthusiasts. Some will swear by chicken necks and wings, while others prefer beef scraps. The availability of chicken

in the home refrigerator and its ability to withstand several hours of crab fishing makes it a popular bait.

Blue Crabs Spawn in July

Spawning blue crabs fill the Gulf surf in July, and large numbers of people flock to the beaches to take advantage of this season. Sponge (egg-carrying females) and spent (spawned females) crabs are easy prey for dip nets. However, Texas law now prohibits the keeping of sponge crabs, easily recognized by the orange glob of eggs on their underside.

Sport Crabbing Valuable

A survey of the Galveston Bay fishery by Texas Parks and Wildlife Department biologists provided information to substantiate the popularity of sport crabbing and its impact on an area. Data gathered from the survey determined that sport crabbing contributes considerably to the area's economy.

Department personnel counted 41,000 crabbers and interviewed 887 from April through December of 1968.

Fifty stations, each selected for ease of public access, were established for the study. Bridges, ditches, bayous, piers, rock groins, jetties and beaches were checked for crabbers.

The survey showed that crabbing activity usually depends upon the weather, although people were observed crabbing throughout the year.

Women 38% of Crabbers

The fairer sex are ardent crabbers and made up 38% of those interviewed. Children under six years of age comprised 22% of the total. Also, sportsmen often combine crabbing with fishing. Of the 1,775 groups encountered, 15% did both. Generally, it appears that adults fished while their children went crabbing. This kept children nearby, and often the children provide the only seafood to take home.

Cost of Sport

The average cost of the sport was \$.80 per person, or \$3.00 per group.