

# SUPREME COURT UPHOLDS ARMY ENGINEERS' VETO OF FLORIDA DREDGE PLAN

In a landmark decision that cheered conservationists, the U.S. Supreme Court, on Feb. 22, 1971, upheld the right of the U.S. Army Corps of Engineers to deny a permit for dredging and filling in navigable waters if the work threatens to injure fish and wildlife. The court action climaxed nearly 12 years of litigation on the Zabel-Russell project in Boca Ciega Bay, near St. Petersburg, Florida. A lawyer for the private interests said: "This is the end of the line. There is no more Zabel-Russell fill proposal."

## Background of Case

The controversy began in 1958 when D.H. Russell and A.G. Zabel applied for dredge and fill permit. They had developed the Causeway Village trailer park on land they owned on Boca Ciega bayfront in S. Pasadena, southwest of St. Petersburg. They wanted to create an 11½-acre island in the bay west of their trailer park. They planned to get the fill they needed for the island by dredging the bay. Connected by a bridge to the mainland, the island would become an extension of the trailer park.

## Conservationists Oppose Plan

Conservationists organized quickly to resist the plan. For years they had criticized the Corps of Engineers for damaging the environment with unneeded landfills, reclamation of wetland, and alterations of stream channels.

Local and national conservation groups were backed by Interior Department's Bureau of Sport Fisheries and Wildlife, the Florida Department of Natural Resources, some Florida legislators, and the Pinellas County Commission.

Playing important background roles were biologists of the NMFS St. Petersburg Beach

Laboratory under Jim Sykes, and Ed Arnold, Chief of NMFS Southeast Region's Office of Water Resource Studies. The biologists had been studying Gulf Coast estuaries for years. They concluded that landfills already caused an annual loss of \$1.4-million in fishery products in Boca Ciega. When the Engineers asked their opinion, they voted no.

In 1967, the Corps of Engineers, after asking and receiving the opinions of several government agencies, denied the permit. In that year, U.S. District Judge Ben Krentzman of Tampa reversed the denial.

On July 17, 1970, the U.S. 5th Circuit Court of Appeals in New Orleans, Louisiana, overturned Judge Krentzman's decision.

The Appeals Court noted that the permit application would have been granted several years ago when the Corps of Engineers dealt only with navigation. But, the court emphasized, that was "before man's explosive increase made all, including Congress, aware of civilization's potential destruction from breathing its own polluted air and drinking its own infected water and the immeasurable loss from a "Silent Spring"-like disturbance of nature's economy."

Now the engineers are bound by the National Environment Policy Act of 1969, the Court held, even though the Act was not on the statute books when the Russell-Zabel case was first heard.

On Feb. 22, 1971, the U.S. Supreme Court refused to hear an appeal from the decision of the U.S. 5th Circuit Court of Appeals--thus ending the long controversy.

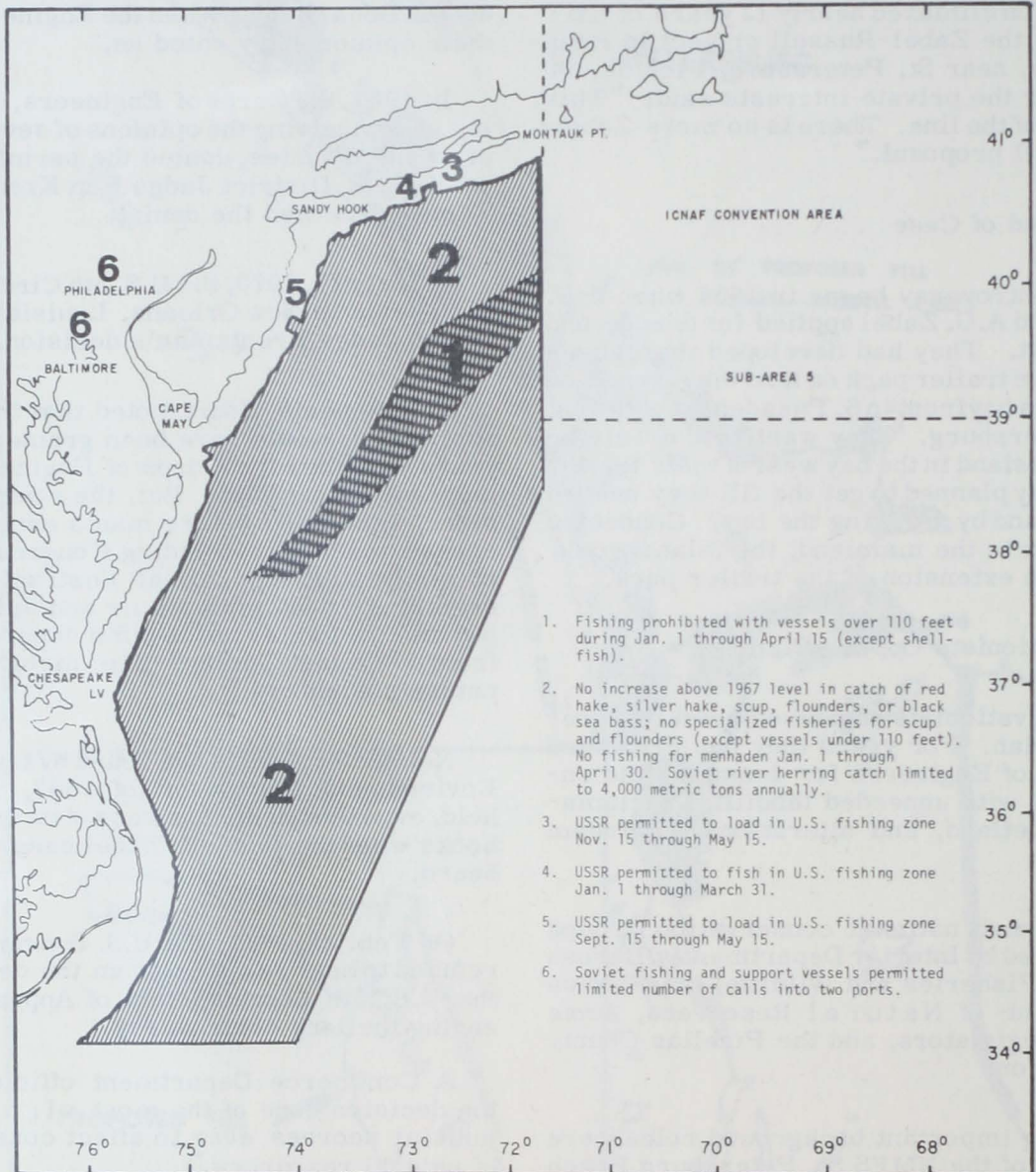
A Commerce Department official called the decision "one of the most significant judicial decrees ever to affect conservation of natural resources."





## U.S.-SOVIET FISHERIES AGREEMENT

### effective Jan. 1, 1971



# U.S. & USSR SIGN MID-ATLANTIC FISHERIES AGREEMENT

On Dec. 11, 1970, the U.S. and the Soviet Union signed an agreement in Washington on fisheries off the U.S. Middle Atlantic coast. It took effect Jan. 1, 1971. An addition to the agreement was signed Feb. 2, 1971. The area covered extends roughly from west of Block Island in north to Cape Fear (North Carolina) in south.

The agreement extends and modifies U.S.-USSR Mid-Atlantic agreements of 1967 and 1968.

The new agreement affords greater protection for 4 species important to U.S. sports and commercial fishermen. It extends conservation measures to 3 more species.

## Provisions of Agreement

In northern part of agreement area, protection was increased for red hake, silver hake, scup, and flounders, species previously covered under U.S.-USSR agreement. Protection was extended to black sea bass, important to U.S. sports fishermen.

A specified offshore area (see map), closed to large vessels from Jan. through March under 1968 agreement, will now be closed Jan. 1 through April 15. The area is on high seas well outside U.S. jurisdiction. The closure protects vulnerable winter concentrations of scup and flounders. It ensures access of red and silver hake to spawning grounds. The added two weeks' protection comes at a very critical spawning period, say U.S. scientists who participated in the negotiations. It is a significant limitation on Soviet fishery.

## Significant Changes

In southern part of agreement area, said Ambassador Donald L. McKernan, head of U.S. delegation, two significant changes are valuable to U.S. fishing interests:

"First, the southern boundary . . . has been extended approximately 75 miles from Cape Hatteras almost to Cape Fear. Vulnerable stocks of fish which are of great value to the

American fishermen in this area will now be subject to conservation regulations. In the absence of this Agreement, Soviet fishermen would be free to fish for any species in any quantity, for Soviet law permits controls over their fishermen only pursuant to such international agreements."

Second, menhaden, the largest U.S. fishery in Mid-Atlantic, is now covered. "Offshore fishing for menhaden will be prohibited during the months of January through April. During these months the menhaden spawn offshore. This limitation will ensure that the stock will reproduce and return to the inshore area where it is subject to the U.S. fishery during other months of the year."

In the addition to the Agreement, Feb. 2, 1971, the Soviets agreed to limit their catch of river herring to 4,000 metric tons a year.

The two delegations also agreed that there is an urgent need to adopt conservation measures in the Mid-Atlantic for the depleted sea herring.

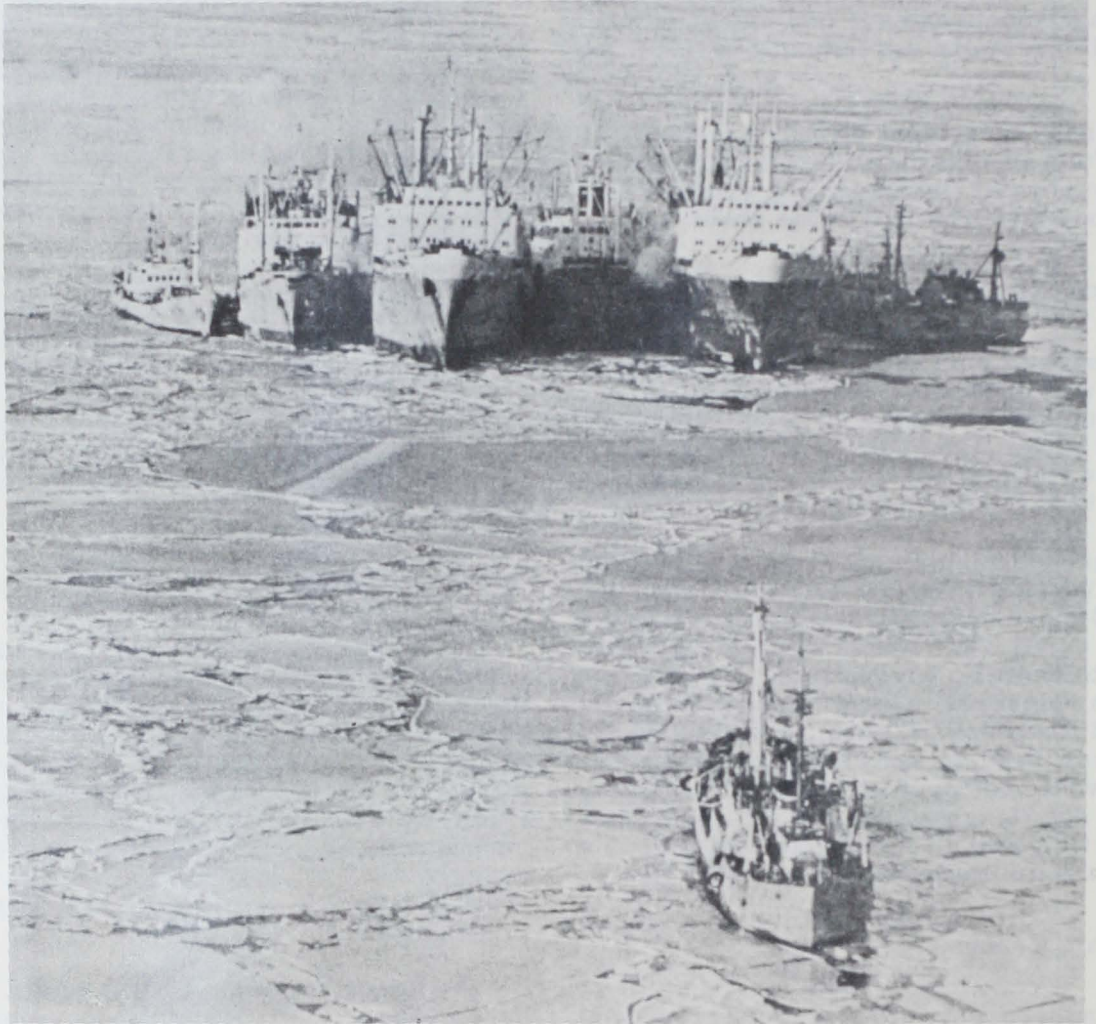
## Soviets Allowed Loading Areas

The Soviet fishing fleet will continue to be allowed to use for loading 2 small areas within the U.S. 9-mile contiguous fishing zone off New Jersey and Long Island. Also, the U.S. will permit the Soviets to fish in a small area off Long Island during specified periods during the winter. In addition, in return for Soviet cooperation in conserving species of special concern to U.S. fishermen, entry by Soviet fishing vessels into certain U.S. ports was made easier.

The new agreement is for 2 years. It can be amended any time, as contemplated for river herring and sea herring, or even be renegotiated.

The U.S. delegation included Federal, state, and local experts. The Soviet was led by First Deputy Fisheries Minister V.M. Kamentsev. (U.S. State Dept., Dec. 11, 1970, and Feb. 2, 1971.)





Far from stormy seas, 7 Soviet vessels--motherships to medium side trawlers--nest together to transfer fish and cargo. Another side trawler approaches to make delivery. The vessels belong to Soviet herring fleet, which was operating near St. Matthew Island in Bering Sea. Fleet was anchored 30 or more miles from ice. It is common practice for ships to take shelter from seas and icing conditions by running inside the ice. All Soviet vessels in this winter fishery are reinforced for travel in pack ice. (Photo: M. C. Zahn, Dec. 31, 1969.)

# U.S. & USSR SIGN 3 AGREEMENTS

The U.S. and the Soviet Union signed 3 agreements on Feb. 12, 1971, relating to northeastern Pacific fishery problems. The agreements, which replace three previous ones, became effective immediately and will remain in effect for 1971 and 1972. They were signed by U.S. Ambassador Donald L. McKernan and Vladimir M. Kamentsev, Soviet Deputy Minister of Fisheries.

## I. Eastern Bering Sea Crab Fisheries

It was agreed that the Soviet harvest of king and tanner crabs be reduced to 23,000 cases of canned crab (56% reduction in quota) and 35,000 cases of canned tanner crab (12.5% reduction in quota). Also, the legal minimum size of harvestable male king crabs was increased from  $5\frac{3}{4}$ " to  $6\frac{1}{4}$ ". However, the Soviet representatives stated that they would take no more than 12,800 cases of king crab of their quota of 23,000 cases. It was agreed that, in view of this catch level, the increased minimum size limit would not apply to Soviet fishermen in 1971 and 1972.

Also, the Soviet Union will reduce amount of tangle net gear used to capture crabs in 1971 and 1972. She will emphasize development and use of pot gear used by U.S. fishermen. The sanctuary where only crab pots may be used will be retained. This area is closed to trawling to prevent conflicts arising from the use of stationary instead of mobile fishing gear.

The two other new agreements provide improved protection for stationary fishing gear to conform to king crab and tanner crab fishing season in areas westward along Aleutian Islands and in Gulf of Alaska near Kodiak Island. The period closed to mobile gear in 3 of the 6 areas off Kodiak was extended by  $3\frac{1}{2}$  months.

To reduce conflicts between trawl fishermen and halibut fishermen, special measures are provided for 3 main halibut fishing

grounds in eastern Bering Sea and 3 areas in Gulf of Alaska--including a closure to mobile gear during beginning of halibut fishing season.

## II. Off Washington, Oregon, California

The existing 6 areas on high seas established to protect Pacific Ocean perch and other species of rockfishes were expanded seaward from 450-meter depth to 600-meter depth.

The period in which trawling will be prohibited during winter months in these 6 areas when perch and other shelf rockfishes congregate also was increased by 15 days.

It was agreed that other measures--use of trawl nets of certain mesh sizes, avoidance of areas of rockfish concentration, catch limitations--would be implemented to provide increased protection for these resources.

## III. 3-12-Mile Zone In Aleutians

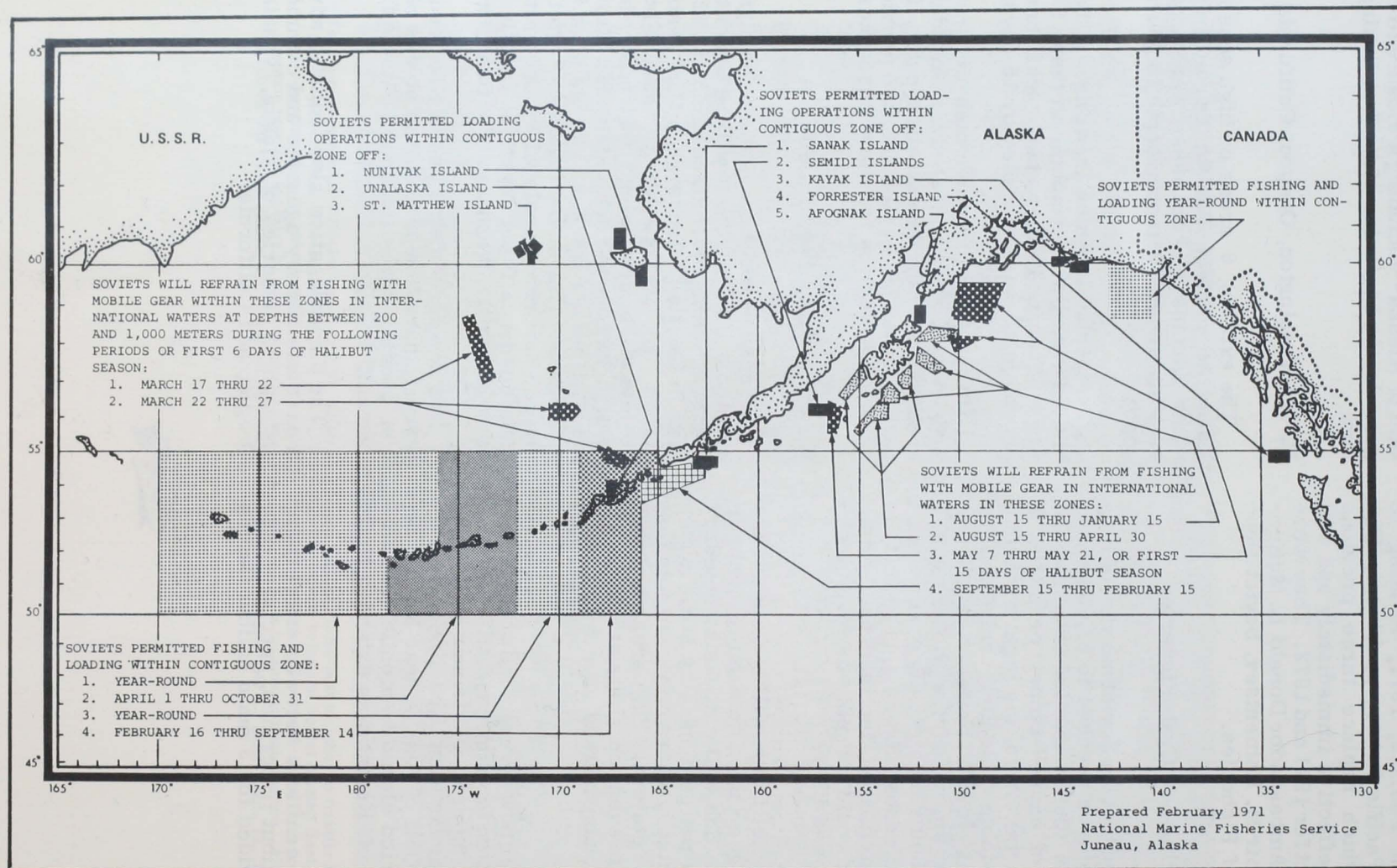
In return for concessions on high seas granted to U.S., the USSR will be permitted to continue fishing for finfishes in 3- to 12-mile zone in Aleutian Islands when U.S. crab fishermen are not operating there. Also, the Soviets will be able to load and transfer in U.S. contiguous zone in 3 new localities: Semidi Islands in Gulf of Alaska, and St. Matthew Island and Makushin Bay in Bering Sea. Soviet fishing and support vessels will be permitted to make up to 4 calls per month at Pacific Coast ports of Seattle, Wash., and Portland, Oregon.

The new agreements provide for cooperation in fishery research on fish stocks of mutual concern and exchange visits to fishing vessels.

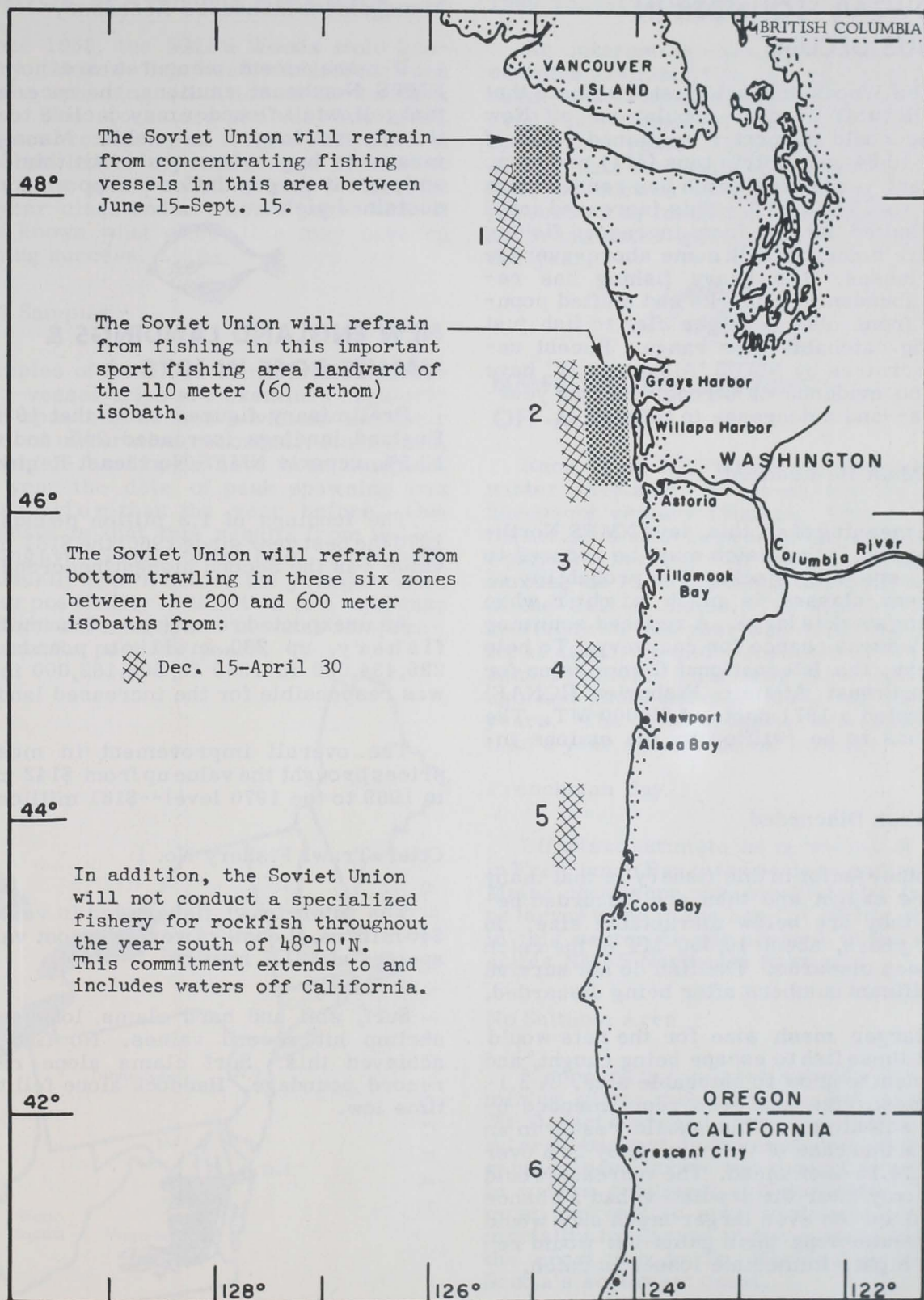
The U.S. delegation also included advisers from state fishery agencies and commercial and sports fisheries of Alaska, Washington, Oregon, and California.







U.S.-USSR Fisheries Agreements Concerning the U.S. Contiguous Fishery Zone Off Alaska, February 1971.



U.S.-USSR Contiguous Fishery Zone Agreement (Pacific NW Area) - February 1971.



## YELLOWTAIL FLOUNDER IN SERIOUS DECLINE

NMFS Woods Hole scientists estimate that the yellowtail flounder populations off New England could support a sustained yield of 21,000 to 34,000 metric tons (MT) per year. In recent years, the catch has ranged from 43,000 to 58,000 MT. This increased catch has resulted largely from increased fishing pressure combined with some above-average year-classes. The heavy fishing has reduced abundance of stocks and shifted population from older, larger fish to fish just entering catchable size range. Recent research cruises by NMFS 'Albatross IV' have found no evidence of strong entering year-classes--and a decrease in total stock.

### Catch Must Be Reduced

The meaning of all this, says NMFS Northeast Region, is that catch must be reduced to build up spawning stocks. The probability of good year-classes is much higher when spawning stock is large. A reduced spawning stock lessens chance for recovery. To help recovery, the International Commission for the Northwest Atlantic Fisheries (ICNAF) has adopted a 1971 quota of 29,000 MT. The quota has to be ratified by the nations involved.

### Many Fish Discarded

Another factor in this fishery is that many fish are caught and then are discarded because they are below marketable size. In recent years, about 10,000 MT of the catch have been discards. The fish do not survive in significant numbers after being discarded.

A larger mesh size for the nets would permit these fish to escape being caught, and allow them to grow to catchable size. A 5.1-inch mesh size has been recommended by NMFS scientists. This should result in an eventual increase of the harvest by 10% over current 4.15-inch mesh. The increase would occur only after the population had a chance to build up. An even larger mesh size would have greater long-term gains but would result in higher immediate losses in catch.

## Management Measures Necessary

If management measures are not taken, NMFS Northeast cautions, the once-important yellowtail flounder may decline to where it may no longer be viable. Management measures begun now could halt this decline and permit the population to support a sizable sustained yield.



## NEW ENGLAND LANDINGS & VALUES ROSE IN 1970

Preliminary figures show that 1970 New England landings increased 24% and values 13.5%, reports NMFS Northeast Region.

The landings of 1.3 billion pounds made 1970 the best year since 1966; the \$161 million value was the second highest recorded.

An unexpected resurgence of the menhaden fishery, up 280 million pounds, from 225,434,000 in 1969 to 505,182,000 in 1970, was responsible for the increased landings.

The overall improvement in most fish prices brought the value up from \$142 million in 1969 to the 1970 level--\$161 million.

### Otter-Trawl Fishery No. 1

The otter-trawl fishery led in value with \$40 million. Lobsters were the most valuable species at \$31.7 million.

Surf, soft and hard clams, lobsters, and shrimp hit record values. No finned fish achieved this. Surf clams alone reached record poundage. Haddock alone fell to all-time low.

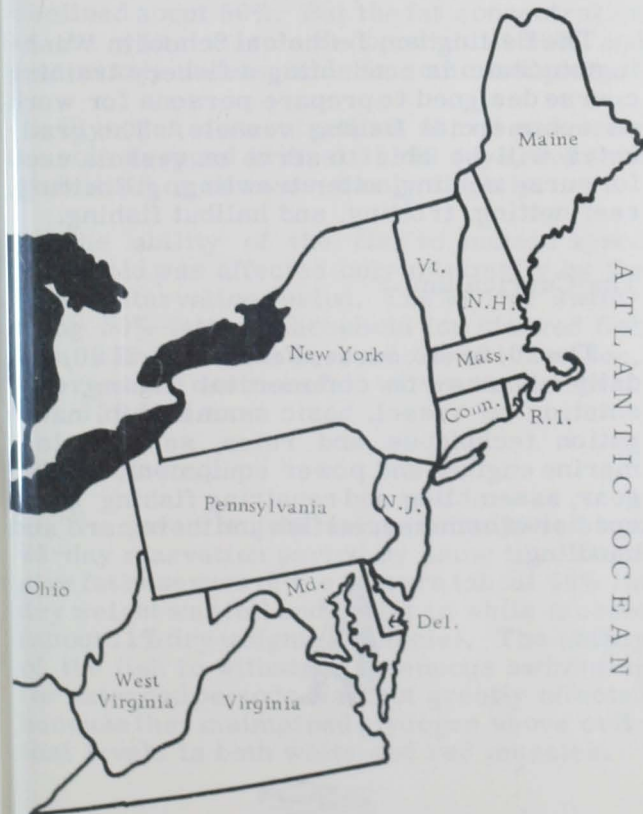


## MONITOR SPAWNING HADDOCK

Since 1968, the NMFS Woods Hole Laboratory (Mass.) has been monitoring each year the spawning condition of the haddock stocks. The stocks are at a very low level. The poor recruitment for the past several years has led to a peculiar age structure: Most of the mature fish belong to the last good year-class and are now 8 years old. It is not known what effect this may have on spawning success.

14,000 Samples

Samples of fish from commercial and research-vessel trips are examined regularly as the spawning season advances and their degree of maturation recorded. Since 1968, over 14,000 haddock have been sampled. Each year the date of peak spawning has been earlier than the year before. One hypothesis is that this results from the increasing average age of the fish. Older haddock usually spawn before the younger ones. Another possibility is that this is a response to a slight warming trend in water temperature over the past few years.



## 1969 Year-Class Haddock

An interesting sidelight from the first samples examined this year is the presence, about 10% of total, of some haddock from the 1969 year-class. Very few of these fish will spawn this year. They are so small, 34 to 47 cm, that they will contribute little to the total production of eggs. However, their presence may mean that this year-class was underestimated when sampled as young-of-the-year.



## NMFS STUDIES HERRING OFF MAINE

Each year, NMFS biologists estimate the winter mortality of larval herring in the Sheepscot estuary (Maine). This is one of the methods used to predict the abundance of immature herring that will be available for canning as sardines along the western coast of the Gulf of Maine. The winter (1970-71) mortality for this year was estimated as 37% for 15 days from mid-December 1970 to mid-January 1971. This was less than a year ago and about average (35%) for the past 7 years. The catch of larvae was much lower than a year ago and below average.

### Frenchman Bay

Efforts to estimate the mortality of larvae in Frenchman Bay in the eastern sector of the Maine coast were unsuccessful--by January, no larvae were in the bay. A larvae scarcity in this sector is not unusual in the winter, states NMFS Northeast Region.

### No Suitable Area

It appears that an area suitable for determining winter mortality does not exist from Mt. Desert eastward. However, larvae usually are abundant in the eastern sector in the spring; these larvae are thought to originate in waters southwest of Nova Scotia. So, the most appropriate area to determine winter mortality for larvae in the eastern sector of the coast may be St. Mary's Bay on Nova Scotia's southwest coast.





## E. COAST DEEP-WATER LOBSTERS TRANSPLANTED IN PACIFIC NW

A feasibility study on transplanting East Coast deep-water lobsters (*homarus americanus*) to Oregon waters was initiated in December 1969 by University of Rhode Island (URI), Oregon State University, and Oregon Fish Commission. Capt. James McCauley carried out URI's part by supplying more than 500 lbs. of adult lobsters and air-shiping them to Oregon. The lobsters were obtained from the offshore population and consisted of males and berried females. The shipping mortality was less than one percent. Most were judged extremely hardy on arrival in Oregon.

### Unfavorable Hydrographic Conditions

Prof. Jeff Gonor, Oregon State Marine Science Center, Newport, Oregon, has informed URI that hydrographic conditions at 100-fathom line do not permit adequate survival of larvae released by berried females. Surface-water temperature off Oregon in spring and summer usually averages around 12°C (about 54°F), which causes exceedingly slow development of larvae. In turn, this results in exposure of larvae to surface and midwater predators for so long a period that entire stock is eliminated.

### Other Experiments Promising

However, other experiments with the lobsters have indicated "potentially promising developments" in another area. The seasonal temperature fluctuations of the sea water supply from the bay adjacent to Oregon's Marine Science Center is adequate for adult survival. In fact, summer refrigeration would not be needed for any holding pounds between northern California and Washington.

Thus, says URI, there appears to be merit in considering commercial sales of lobster from holding pounds on U.S. northwest coast. The pounds could be stocked during peak landings on east coast--and might stabilize price to lobstermen at desirable level.



## RECORD SHRIMP CATCH SET ON PACIFIC COAST IN 1970

The 1970 shrimp catch along the Pacific coast hit a record 92.4 million pounds, heads on, up 29.9 million pounds (48%) from 1969's record 62.5 million pounds.

The fast-growing Alaskan shrimp fishery soared to record 74 million pounds, heads on, a rise of 26.2 million pounds (55%) from 1969.

Also records were Oregon's 13.4 million pounds and California's 4.038 million.

### Kodiak Sets Pace

Kodiak's shrimp landings of 62.4 million pounds were 84% of Alaska's total--and 68% of entire Pacific Coast catch.



## COMMERCIAL FISHING COURSE AT BELLINGHAM, WASH.

The Bellingham Technical School in Washington State is conducting a fishery training course designed to prepare persons for work on commercial fishing vessels. The graduates will be able to serve on vessels used for purse seining, otter trawling, gillnetting, reef netting, trolling, and halibut fishing.

### The Curriculum

The 10-week course, Feb. 22-April 30, has daily classes--on commercial fishing, orientation on vessel, basic seamanship, navigation techniques and rules, safety rules, marine engines and power equipment, fishing gear, assembling and repairing fishing gear, species of commercial fish and their care and handling.





## STUDY EFFECTS OF STARVATION ON SWIMMING OF YOUNG JACK MACKEREL

Drs. John Hunter and Reuben Lasker began an experiment in January 1971 to determine the effects of starvation on the extent and distribution of fat and glycogen reserves, and on swimming abilities, in juvenile young-of-the-year jack mackerel. The work will help determine the likelihood of survival of young-of-the-year juveniles during their first winter--when effects of mortality on year-class strength may be most significant.

The scientists are with NMFS Fishery, Oceanography Center, La Jolla, Calif.

Fish were starved for 45 days and samples taken for biochemical analysis at 5-day intervals. Endurance swimming of the fish was tested at beginning and at end of experiment.

### Preliminary Findings

Preliminary analysis of the biochemical data indicates that the fat concentration of the viscera declined about 50% over the 45-day starvation period. Fat concentration in the red muscle, and the total mass of that muscle, declined about 50%. But the fat concentration in the white muscle dropped about 90%, and was nearly undetectable in some samples.

Glycogen concentrations of red and white muscle dropped in first 15-20 days, but then stabilized or decreased only slightly.

The ability of the fish to sustain speed threshold was affected only minimally by the 45-day starvation period. The 6-hour swimming 50% fatigue threshold for starved fish was within the interval 98-121 cm/sec, whereas the controls fell within the interval 121-139 cm/sec.

### Fish Adjusted

The juvenile jack mackerel adjusted to a 45-day starvation period by using the extensive fat reserves of the viscera (about 60% its dry weight was fat) and the fat in white muscle (about 11% dry weight of muscle). The ability of the fish to withstand strenuous swimming for extended periods was not greatly affected because they maintained glycogen above critical levels in both white and red muscles.



## GENERATIONS OF PLANKTON REARED IN LAB

Dr. Michael R. Reeve has reared planktonic chaetognath (*Sagitta hispida*) through more than one generation in the laboratory, reports the University of Miami's School of Marine and Atmospheric Science.

The minute, transparent, sea animal was "reared from egg to adult and the second-generation egg stage in 3 to 4 weeks."

Scientists believe chaetognaths are second most important animal plankton in many parts of the oceans. They feed on copepods, the primary animal plankton group that eats plants. *S. hispida* is common in Florida coastal waters.

### Meaning of Achievement

The school believes that Dr. Reeve's success brings closer the time when interactions of microscopic marine animals and plants--which form base of marine-food production and distribution web--may be seen in miniature laboratory communities.



## 3,325 WHALES PASS YANKEE POINT, CALIF., IN 67-DAY CENSUS

The annual count of migrating gray whales at Yankee Point, near Monterey, Calif., was completed Feb. 13, 1971, reports NMFS Fishery-Oceanography Center, La Jolla. Robert Strawn and Stephen Treacy counted 3,325 whales moving south past the Point during daylight.

The total gray-whale population--including allowance for whales that passed at night and those missed in periods of poor visibility--was estimated at about 10,000-11,000. The annual counts have remained about the same for the past 4 years; the population size appears "essentially stable".





# NMFS BEGINS COOPERATIVE FISHERY-ADVISORY PROGRAM WITH TUNA FISHERMEN

A gray box is being added to the chart-room equipment of San Diego-based tuna purse seiners, which fish for yellowfin and skipjack tuna in the eastern Pacific Ocean. Installed by technicians of NMFS Fishery-Oceanography Center, La Jolla, Calif., the boxes are radio facsimile recording sets. These are able to receive direct oceanographic and weather information on 12- by 19-inch charts transmitted daily by Federally licensed radio station WWD at nearby Scripps Institution of Oceanography.

## Environmental Data From Vessels

Dr. Alan R. Longhurst, Director of the Center, explains that this fishery advisory service is being tried experimentally to obtain environmental data from fishing vessels, and to provide fishermen with information that may help them make tactical fishing decisions. He emphasizes that the environmental data collected by fishermen are necessary for use in the Center's development of fishery-forecasting techniques and methods for tropical tunas.

Each day, information on sea-state, including direction and height of swells, and height of wind-waves is plotted onto a chart

for transmission to fishermen on the fishing grounds; weekly, an analysis of 7-day sea-surface temperatures is plotted for transmission.

## Chart Information

A second daily chart provides information on direction and speed of surface winds, location and direction of movement of tropical storms, and location of areas of squalls and potentially threatening weather conditions.

In the near future, a weekly analysis of mixed layer depths, the depth at which warm surface waters meet cooler waters below, also will be included in the charts.

Eventually, the location of small-scale ocean-surface temperature features as indicated by temperature measures made by orbiting weather satellites and received at the Center also will be added to the charts. The charts cover the American west coast to 140° W., between latitudes 30° N and 5° S. According to Dr. M. Laurs, leader of Fishery-Oceanography Program, who is directing the work, the information on the charts is tailored to needs of fishermen on tuna fishing grounds in eastern tropical Pacific.



# OREGON FISH COMMISSION SURVEYS ESTUARIES

The Fish Commission of Oregon began an intensive study of the state's estuaries on March 1. Purpose is to determine how many people use the estuaries, the distribution of these people, and how much of the harvest of fish and shellfish is for personal use. Commission biologists aided by State Game Commission personnel will survey the state from the Columbia River in the north to the Chetco River on the south coast.

## Importance of Estuaries

Marine biologists note the importance of estuaries as a rich feeding ground for young fish and shellfish, and as spawning grounds for marine finfish. The biologists are interested particularly in bay clams, an important recreational and commercial shellfish found only in the tidal areas of Oregon's estuaries. Rich nutrients, sheltered waters, and ideal spawning conditions make estuaries unique and vital natural resources.

Oregon's estuaries are only 1/10 of 1% of its geographical area, fewer than 56,000

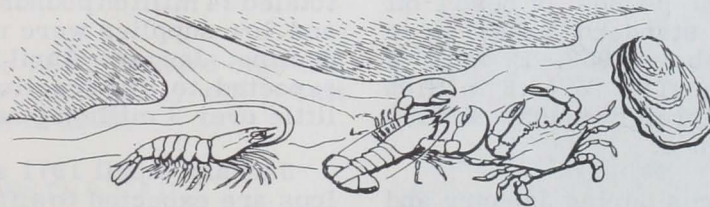
acres in all. All could be placed easily into Willapa Bay, Washington.

Estuaries are under critical pressure from increasing filling, alterations, and development of bay and tideland areas for housing, industry, and highways. Preservation and wise use depend on responsible planning and management, the Commission states.

## Public Can Help

Clam diggers and fishermen using Oregon's bays in 1971 have been asked to cooperate with the biologists conducting the resource survey. Their considered answers to questions would produce an accurate reflection of the current use of these bay and river-mouth areas.

Legislation passed in 1969 requires counties to zone their lands by Dec. 31, 1971. The study will be an important guide to city and county planning for the coastal communities. Results will be made available to all agencies planning the protection and enhancement of the state's valuable estuarine resources.





# SHELLFISH SITUATION AND OUTLOOK

Richard W. Surdi & Donald R. Whitaker  
NMFS Current Economic Analysis Division

Supplies of shrimp available for consumption were a record 541 million pounds, heads-off weight, during 1970. Compared to 1969, supplies of northern shrimp rose 26% to 65 million pounds, while supplies of southern shrimp rose 13% to 476 million pounds.

U.S. landings of shrimp during 1970 were a record 224 million pounds, heads-off weight. Increased landings in the Gulf and the West Coast offset declines in the South Atlantic and New England.

Imports of shrimp rose sharply to 219 million pounds, product weight, during 1970. Each product category of imports rose above the previous year. Imports were again at about 53% of combined total of landings and imports.

In addition to record supplies, consumption was also a record. Increasing about 14%, apparent consumption of shrimp in all forms was 413.7 million pounds, heads-off weight. Northern shrimp sales were 44 million pounds during 1970; consumption of fresh and frozen southern shrimp rose 12% to 339 million pounds, or 95% of total fresh and frozen consumption.

The average price for shrimp landed in U.S. fell to 57.3 cents per pound on heads-off basis. The average wholesale price for 26-30 count raw headless shrimp at Chicago dropped about 4% to \$1.26 per pound. The 41-city average retail price for breaded shrimp was \$1.63 per pound in 1970--7% above 1969.

About 67.7 million pounds of heads-off shrimp (3.9 million standard cases) were canned in 1970--43% above 1969. Exports of domestic shrimp rose 11% to 40.8 million pounds; exports of foreign-caught shrimp were 14.8 million pounds.

Despite jump in prices during January and February 1971, consumption is expected to be higher than 1970--at about 102 or 103 million pounds for January-April. Canning in Gulf States is expected to total about 800,000 pounds, heads off. Domestic exports of fresh

and frozen shrimp may increase slightly to 14 or 15 million pounds in January-April 1971.

January-April 1971 landings in South Atlantic and Gulf are expected to be about equal to 20.6 million pounds in 1970 period. New England landings may decline, but West Coast landings are expected to increase again in 1971.

Despite January decline, imports are expected to rise 2 or 3 million pounds above January-April 1970 to 78 or 79 million pounds, heads off.

The combination of 180 to 182 million pounds of supplies and utilization of 121 to 124 million pounds would result in May 1 stocks of 58 to 60 million pounds--slightly above 56 million pounds on hand May 1, 1970.

## SCALLOPS

Supplies of sea scallops in 1970 were 26.1 million pounds. U.S. sea scallop landings of 7.1 million pounds continued the declining trend that began after peak catch in 1961. As abundance has continued to decline, fishing effort has fallen sharply.

U.S. imports of scallops were 16.8 million pounds in 1970--up nearly 18% from 1969. While imports of Canadian scallops declined 10%, substantial increases from other countries more than offset decline.

During 1970, consumption of sea scallops totaled 24 million pounds. Record high prices and low supplies were major factors in this decline. January-April 1971 consumption is expected to slip fractionally from 1970 to a little over 6 million pounds.

January-April 1971 supplies of sea scallops are expected to slip slightly from same period 1970. Landings of sea scallops will probably be lower again this year; the majority of decline is expected in New England. High prices on U.S. market again are likely to spur imports in 1971. Imports during



January-April may increase to about 4.3 million pounds.

Combining supplies of 7.8 million pounds and consumption of 6.2 million pounds would result in about 1.6 million pounds in inventories on May 1.

Total landings of calico scallops were 2.1 million pounds during 1970--up sharply from 183,000 pounds landed during 1969. Most of 1970 catch was landed in North Carolina, which reported 1.8 million pounds.

#### NORTHERN LOBSTERS

Supplies of northern lobsters during 1970 dropped about 4% from 1969 to 60.6 million pounds, live weight. U.S. landings of northern lobsters were estimated to be 30.4 million pounds--also down 4% from 1969. All of the decline in landings occurred in Maine, which fell about 8% from 1969. A decline in pot fishery was partially offset by increases in the otter trawl and other fisheries.

At 19.5 million pounds (product weight), imports of Canadian lobsters were 5% below 1969 total. All three categories of live, canned, and cooked meat were below previous year.

Demand for northern lobsters continue strong throughout 1970. With supplies slipping somewhat, the high level of demand caused prices to set records.

Supplies of northern lobsters in first 4 months of 1971 are expected to decline slightly from 1970. Preliminary data indicate that Maine landings in January were running below 1970. Imports are also expected to decline.

Declining supplies and continued high demand during January-April likely will result in higher prices than in 1970.

#### SPINY LOBSTER TAILS

Supplies of spiny lobster tails of 40 million pounds were 6% below record available in 1969. Record-high beginning inventories were more than offset by a 4.8-million-pound drop in imports.

Imports of lobster tails fell 13% to 32.5 million pounds. The share of U.S. market

held by cold-water tails continued to slip during 1970; that of warm-water tails rose correspondingly.

Inventories generally declined from a record of 7.5 million pounds on Jan. 1, 1971.

Apparent consumption of spiny lobster tails was a record 35.7 million pounds. This increase was possible because of reductions in inventories. As price rose above 1969's during the last 4 months of 1970, sales dropped off.

January 1970 wholesale prices for 6- to 8-oz. cold-water lobster tails were 81 cents below the previous year. That price rose to a record in November of \$4.00 per pound.

Conditions in January 1971 pointed to increase in imports during first 4 months. The level of prices in January, however, appeared prohibitive to greatly increased consumption. If imports rise sharply, prices may dip somewhat from January level.

#### WEST COAST CRABS

Supplies of West Coast crabs (king, dungeness, and snow) were about 138.5 million pounds, live weight, in 1970. Lower inventories of frozen crabs and imports offset an increase in landings.

West Coast crab landings were 123.4 million pounds, live weight, during 1970. Dungeness-crab landings increased for 6th consecutive year to record 57.2 million pounds. The snow-crab fishery in Alaska rose to 15.2 million pounds, while Alaska king-crab landings declined 12% to 51 million pounds.

During 1970, demand for king and dungeness-crab products improved, but it weakened for snow crabs. Prices for most crab products were below 1969's.

King-crab landings in 1971 may drop below 1970. This would result in some crab vessels switching to other fisheries. Although prices of imported canned king crabs are currently (mid-March) below domestic price, some upward pressure may develop if landings are again low in 1971. Dungeness-crab landings may expand somewhat in 1971. But heavy merchandising will be necessary if snow-crab industry is to grow during the year.



# THE CHESAPEAKE BAY ROCK CRAB

Dr. Paul A. Haefner Jr. & Roy T. Terretta

Scientists in VIMS' Department of Crustaceology are currently investigating certain aspects of the biology of the rock crab, *Cancer irroratus* (Fig. 1), in light of its potential for a Chesapeake Bay fishery.

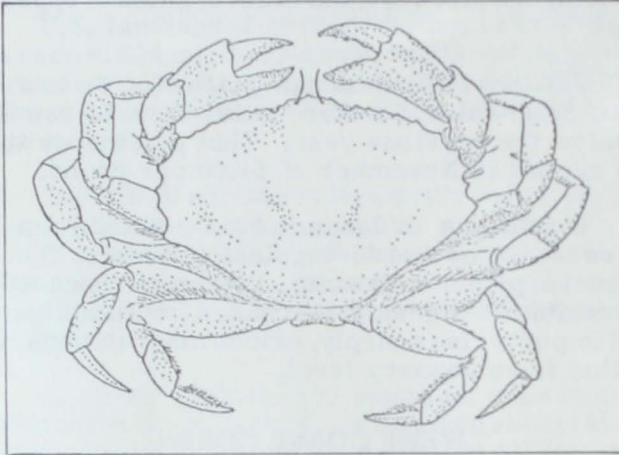


Fig. 1 - The rock crab, *Cancer irroratus*.

The rock crab ranges from Nova Scotia to the South Atlantic States. Known locally as "stone crab", it should not be confused with *Menippe mercenaria*, the true stone crab (Fig. 2), which has a southern distribution.

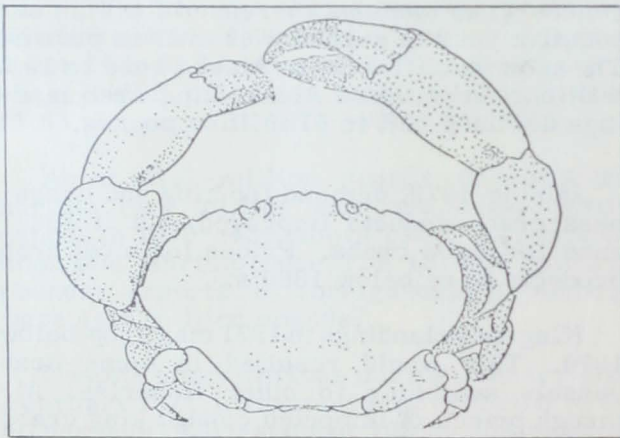


Fig. 2 - The stone crab, *Menippe mercenaria*.

The rock crab is most abundant along the New England coast where it is the main source of edible crab meat. There is no large commercial fishery in that area primarily because of competition from the lobster industry, but there is no other reason why this crab could not be utilized as a food source. Large crabs reach 6 inches in width and contain a large quantity of meat, especially in the claws. The flavor equals that of the blue crab.

## Chesapeake Is Southern Limit

Chesapeake Bay is within the southern limit of the range of the rock crab, a fact obvious from their presence in the catch of the winter dredge fishery for blue crabs. Here rock crabs are now culled and discarded. Some areas of the bay are avoided by dredgers because of the preponderance of rock crabs over blue crabs.

Rock crabs of the lower Chesapeake Bay may be utilized four ways: 1) as picked crab meat; 2) as whole, fresh, or steamed hard crabs; 3) as peeler crabs to shed into soft crabs during the winter months; and 4) as peeler crabs for fishing bait.

## Captains Aid VIMS

Virginia dredge-boat captains have been especially helpful by taking VIMS scientists with them during dredging for blue crabs, which began November 30, 1970. First-hand

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information has been obtained on the distribution and abundance of rock crabs compared with blue crabs, on the ratio of male to female rock crabs, on their average size, and whether they are hard, soft or papershells.

#### Where They Are

Most rock crabs caught in the dredge fishery of Chesapeake Bay are males and may be distinguished from the females by the shape and size of the abdomen or "apron" (Fig. 3). The crabs have been more abundant east of the Chesapeake Bay Bridge Tunnel and are usually found on hard bottom. Above the bridge tunnel, they appeared to be more common on the eastern side of the bay.

Hard crabs have been kept alive and healthy for more than a month at the Institute in indoor tanks supplied with running seawater. Soft crabs have also been produced, particularly

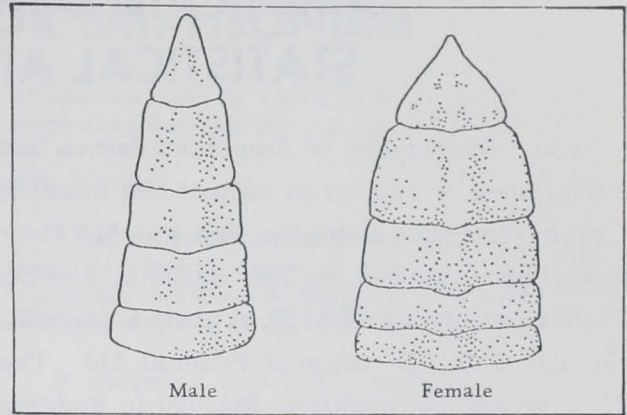
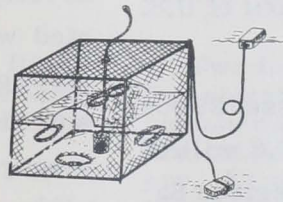


Fig. 3 - The shape of the abdomen or "apron" of the male and female rock crabs.

during January, when a large percentage of the rock crabs caught have been peelers.

Soft rock crabs are "fatter" than soft blue crabs--for any given width, rock crabs weigh substantially more than blue crabs. Four- and 5-inch-wide blue crabs may weigh 2 to 4 ounces, whereas the same size rock crabs weigh  $4\frac{1}{2}$  to 10 ounces. If sold by weight, soft rock crabs would bring a higher market price than their blue crab counterparts.





## AMERICAN SAMOA GETS FISHERY STATISTICAL ANALYSIS PROJECT

The Government of American Samoa has established a project to collect and monitor fishery statistics under the Federal Aid Program administered by the National Marine Fisheries Service (NMFS), reports Edward E. Hueske, Chief, Division of Federal Aid. The 2½-year project requires \$21,000 in Federal funds.

Dr. Stanley N. Swerdloff, Supervisor of Marine Resources, Government of American Samoa, will supervise collection of catch and effort data, and biological data on principal species landed by longline fishery. Data will also be collected on the small inshore subsistence fishery.

### Longline Fishery

The longline fishery based at American Samoa, the most important private enterprise, is conducted through the cooperation of U.S. and foreign firms.

In 1968, the two canneries processed 29,000 metric tons of tuna worth about \$10.6 million to the fishermen. Nearly 1,000 American Samoans are employed. Tuna canning fosters other businesses, which contribute significantly to the islands' economy.

### Monitoring Fishery Revived

Until recently, the Hawaii Area Fishery Research Center (HAFRC) of the National

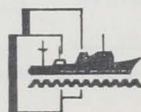
Marine Fisheries Service maintained a field station at American Samoa to monitor this longline fishery. Its purpose was to assess effect on the important tuna resource of the South Pacific. Budgetary limitations forced discontinuation of its operations at Pago Pago. Under the new arrangement with the Government of American Samoa, HAFRC will be able to continue its work.

### Data Collecting Valuable

Despite the large tuna fishery based in Pago Pago, fresh fish appear in the markets only sporadically and in small quantities. The extent of the subsistence fisheries in the villages of American Samoa is not known.

The Government of American Samoa, under the Federal Aid Program, is endeavoring to develop additional fisheries that can be operated wholly by Samoans. Thus, a data-collecting system begun early in this program should produce information vital to effective management of the developing fishery.

Data on the longline fishery will be forwarded to HAFRC for processing and analysis. This will allow a continuing determination of tuna-resource status in the South Pacific. Data on the subsistence fishery will be processed and analyzed by Dr. Swerdloff.

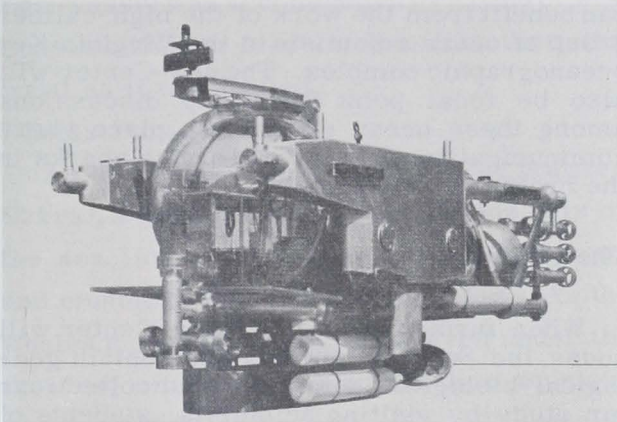




# UNDERSEA RESEARCH VESSEL COMMISSIONED FOR SMITHSONIAN

The Smithsonian Institution commissioned near Ft. Pierce, Fla., in January a 5-man submersible research vessel capable of exploring the ocean at depths of 1,000 feet or more.

The Johnson-Sea-Link, a small acrylic and aluminum diver-carrying vehicle, is named for designer and donors, Edward A. Link, and industrialist J. Seward Johnson. The vessel is capable of staying submerged up to 48 hours.



The Johnson-Sea-Link for exploring ocean depths.

## Need for Ocean Study

Smithsonian Secretary S. Dillion Ripley noted at the commissioning that the Johnson-Sea-Link "holds vast potential for the environmental research scientist. . . .

"We now recognize that the integrity of the world's oceans is jeopardized by the same man-created pollution that has so dismally and dangerously affected other aspects of the human environment including many of our inland lakes and waterways. Now more than ever it is critical to study the oceans, so that we may become wiser stewards of a medium that covers two-thirds of the earth, is essential to all life, and holds so much promise in so many ways.

"Our hope is that this technically advanced, submersible link with man's origins will become an invaluable tool in studying the seas

around us, adding to the body of human knowledge that serves the human family."

## The Vessel

The Smithsonian believes the vessel promises to be one of the most effective small submersible vehicles being built to penetrate the shallow depths of the continental shelf.

It includes a 2-man transparent acrylic sphere, 6 feet in diameter and 4 inches thick. The sphere gives panoramic underwater visibility to a pilot and a scientist-observer. Behind sphere is a separate 3-man, 8-foot-long compartment that will enable 3 scientists to leave from its bottom and collect specimens of flora and fauna.

The 23-foot-long, 18,000-lb. vessel has 6 electric motors that propel it up to four knots. The pilot can scan in all directions through acrylic sphere. This makes it easier for him to hug the bottom and maneuver effectively.

## Safety Emphasized

The engineering of the submersible emphasized safety. More than 100 innovations were incorporated. Switches, connectors, and all operating gear were specially designed.

Two divers will operate as a team outside the chamber and a third will remain inside chamber as a safety officer. When the divers are outside, they will be tethered for recovery. Electronic devices will monitor and transmit diver heartbeat and respiration rates to a surface support vessel. A trained physician will always be on duty during dives.

## Program for Vessel

At first, the vessel will be used off Florida to study the kinds, populations, and distributions of organisms on the shallow sea floor. Also, it will be used to study freshwater upwelling from Atlantic's bottom. As research program progresses, the craft may be used to study sharks, porpoises, manatees, and the biology of coral reefs.



# OCEANOGRAPHY

## NOAA ISSUES FIRST MAPS OF FLORIDA'S SEAWARD BOUNDARIES

NOAA's National Ocean Survey has issued 5 maps in a 6-year program to establish Florida's seaward boundaries. Eventually, more than 400 maps will be published covering Florida's east and west seaward boundaries and the Florida Keys.

The first maps cover a 25-square-mile area at False Cape, immediately north of Cape Kennedy, and the Cape Kennedy and Indian River Inlet areas. Seven more maps of these areas will be issued within the next 6 months.

The program specifies mapping the mean low-water and the mean high-water lines along Florida's tidal waters.

### What's At Stake

At stake in the mapping operation is ownership of coastal and offshore lands intermittently covered by the tide. The problem involves determination of U.S., state, and private boundaries.

In coastal areas, the mean high-water line generally marks the boundary between state and private property. In determining limits between U.S. and state ownership, the mean low-water line is the base line, or starting point. Florida claims ownership beginning at mean high-water line and extending offshore 3 miles beyond mean low-water line along Atlantic coast--and to state's historic boundary not over 3 marine leagues along gulf coast.

### Where To Get Them

The maps are being published at a scale of 1:10,000 (one inch equals 833 feet). Copies may be purchased for \$2.50 each from National Ocean Survey, Distribution Division (C-44), Washington, D.C. 20235.



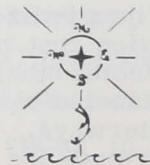
## MARINE SCIENCE CENTER IS DEDICATED IN MIAMI

The \$2.1-million Henry L. Doherty Marine Science Center was dedicated on Feb. 26, 1971, at the Virginia Key Campus of the University of Miami's Rosenstiel School of Marine and Atmospheric Science.

"It will be the focal point of the ocean science and industry complex in South Florida, which now constitutes one of the world's major ocean-oriented communities," said Dr. F.G. Walton Smith, Dean of the School. MSC "will serve as a data center where laymen can benefit from the work of the high-caliber group of ocean scientists in the Virginia Key oceanographic complex. The new Center will also be focal point for group discussions among these ocean experts--a place where communication of ideas will strike sparks in the brains of scientists."

### The Center

When furnished, the 3-story Center will house the School's library and contain geological-biological data files and collections for study by visiting scientists, students of oceanography, and others. The building will have a computer center, dining room, auditorium, and conference rooms. Residence suites for visiting investigators will be available. Also, there will be educational and service facilities to provide oceanographic information to the public. The building is scheduled to be ready in April 1971.





## KILLER WHALES SEEN PURSUING STELLER SEA LIONS

On a recent Bering Sea patrol aboard the USCG Cutter 'Storis', Jim Branson of NMFS Alaska Office of Enforcement and Surveillance, saw a pod of 7 killer whales pursue a band of 20 to 25 Steller sea lions around a Soviet SRTM trawler for over an hour.

Branson reported 9 trawlers operating about 35 miles northwest of Unalaska Island. Each vessel was accompanied by a band of sea lions waiting to feed on fish lost from the trawl as it was hauled.

### Whales Pursue Lions

As the *Storis* came alongside the trawler 'Iskra', a group of killer whales closed in on the sea lions. The latter appeared to panic and clustered alongside the trawler. As the whales moved in, the sea lions dived under the trawler, or swam around the bow or stern seeking safety on the other side. The whales followed but did not attack as long as the sea lions remained tightly grouped. After about 20 minutes, two whales leaped clear of the water and charged the sea lions. A small group of sea lions split from the main group, and one was taken. The whales approached again and again to within a few feet of the trawler and the cutter.

The *Storis* observed the SRTM's trawling operation for an hour and then departed. The killer whales were still harassing the sea lions, which had become very tired.



## DECADES-OLD OCEAN DATA MAY BE A CLUE TO TODAY'S POLLUTION

Oceanographic data collected up to 20 years ago from U.S., Canal Zone, and Puerto Rican coastal waters as part of defense planning will help provide scientists today "with a base on which to determine whether or not significant pollution has invaded these waters," Rear Admiral W.W. Behrens Jr., Oceanographer of the Navy, has disclosed.

The data, which depict the ecology of waters in 13 major harbors and their seaward approaches, have been turned over to NOAA's National Oceanographic Data Center (NODC).

### The Data

The data include analyses of the waters' plankton content, temperature, current flow, and salt, sediment and mineral content, and topography.

The East Coast harbor areas covered ranged from Penobscot Bay, Maine, through Mayport, Fla., to the Atlantic side of the Panama Canal. The Pacific areas spanned the West Coast from the Canal Zone to Puget Sound.

The data included similar collections from Navy-funded surveys by scientists of the National Ocean Survey (formerly U.S. Coast and Geodetic Survey), and by contract oceanographers.

