

acre pond to be reared. The rest of the fish will be used in laboratory experiments involving water temperatures and different types of food.

Bering King Crab Catch Record Set

Fishermen caught a record 27 million pounds of king crab in the Bering Sea this year, reports the Alaska Department of Fish and Game. The catch was more than five million pounds greater than the previous maximum harvest in 1972 and returned nearly \$16 million to the 65 boats involved in the fishery.

The Board of Fish and Game had set a quota of 23 million pounds of king crab in the Bering Sea for the period beginning June 15 and the

area was closed on Sept. 9 when the quota was filled. The other four million pounds had been caught before the quota period began. Bering Sea fishermen have also landed about 300,000 pounds of tanner crab and the area remained open for fishing of this species.

An increase in the number of legal crabs per pot lift indicates that fishing success was higher in 1973 than it has been in previous years. Department biologists say that this may indicate that king crab populations have increased somewhat following a decline from 1966 to 1969 and a period of stable, low abundance from 1970 to 1972. However, the fleet is becoming increasingly mobile each year and is now harvesting king crab stocks in areas where the species has not been fished before.

Publications

University of Rhode Island Publications

The following is a list of recent publications available from the University of Rhode Island Marine Advisory Service. To order the publications direct, make requests to Marine Advisory Service, University of Rhode Island, Narragansett Bay Campus, Narragansett, RI 02882. Make all checks payable to the University of Rhode Island.

"Ecology of Small Boat Marinas," Technical Report No. 5—Order Number P-165, is a 20-page report written by Dr. Scott Nixon, Dr. Candace Oviatt and Sharon Northby, marine biologists at URI's Graduate School of Oceanography. Their principal conclusion: marshes and marinas seem able to peacefully coexist. Much of the same kind of animals and plants that flourished in the marsh also flourished in the marina. The authors have several recommendations on siting and management. \$1.00.

"Chartwork for Fishermen and Boat Operators," Marine Bulletin No. 10—

Order Number P-127, is an 86-page handbook that will enable commercial and sports fishermen or pleasure boat owners to learn or improve their proficiency in chartwork. A few of the subjects covered are reading of the chart, practical chartwork, how to steer a course to combat estimated current and wind, use of the marine sextant and use of soundings to estimate position. \$3.00.

"Navigation for Fishermen and Boat Operators," Marine Bulletin No. 10—Order Number P-131, is designed to teach the basics of deep sea celestial navigation—plotting a course out of sight of land by knowing positions of the moon, sun or stars. The text continues where Chartwork for Fishermen and Boat Operators, stops. The book is divided into two parts: one on principles of navigation and the other on practical problems including use of nautical tables. Seventy-five pages. \$3.50.

"Fisheries Cooperatives: Their Formation and Operation", Marine Memorandum 30—Order Number P-136. This publication is based on a workshop of fisheries cooperatives, held spring (1972) at Galilee, RI. Topics cover how to organize and finance a fisheries cooperative; role of the manager; marketing agreements technical operations; and community relations. Several New England fisheries cooperatives are discussed. Eighteen pages. Free.

Recent NMFS Scientific Publications

NOAA Technical Report NMFS CIRC-378. Borror, Arthur C. "Marine flora and fauna of the northeastern United States. Protozoa: Ciliophora." September 1973. 62 p. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Price: 65 cents.

ABSTRACT

This manual includes an introduction on the general biology, an illustrated key, an annotated systematic list, a selected bibliography, and an index to the marine ciliated Protozoa of coastal and estuarine waters of New England. The key facilitates identification to family of nonencysted, nondividing marine ciliates at any stage in the life cycle.

NOAA Technical Report NMFS SSRF-670. Van Meter, Harry D. "Unharvested fishes in the U.S. commercial fishery of western Lake Erie in 1969." July 1973. 11 p. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Price: 25 cents.

ABSTRACT

Potential commercial fish production was estimated for U.S. waters of western Lake Erie in 1969 from pounds landed and pounds

discarded. Periodic observations of catches in haul seines and trap nets revealed that about 37 percent of the catch (by weight) in haul seines and 26 percent of that in trap nets were low-value fishes that were discarded. Projection of these discarded catches to include the total fishing effort indicated that an additional 2.8 million lb of low-value species would have been landed in 1969 if a reasonable profit had been assured. It is concluded that the sustained yield could be increased considerably with only a moderate increase in fishing effort.

NOAA Technical Report NMFS SSRF-671. Bakun, Andrew. "Coastal upwelling indices, west coast of North America, 1946-71." June 1973. 103 p. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

ABSTRACT

A series of monthly indices of intensity of large-scale, wind-induced coastal upwelling at selected locations along the west coast of North America is presented for the period 1946 through 1971. The indices are based on calculations of offshore Ekman surface wind transport from monthly mean surface atmospheric pressure data. Summaries by quarter and by year are included.

The effect of using monthly mean pressure data is evaluated by comparison to a similar series of monthly means of transports computed 6-hourly over a 4½-yr period. The correlation between the two series at any particular location was found to be high. However, the slope of the regression line varies at different locations. Also values off southern California during summer may be amplified relative to other locations as a result of the discontinuity in the atmospheric pressure gradient caused by the coastal mountain range between the thermal low in the interior of southern California and the higher pressure offshore. The conclusion is that these series may be satisfactory indicators of temporal variations of upwelling at each location, but less satisfactory indicators of spatial distributions.

Book Review

New FAO Fisheries Science Manual

Reviewed by JOSEPH PILEGGI

"Manual of Methods for Fisheries Resource Survey and Appraisal" (Part 2, The Use of Acoustic Instruments for Fish Detection and Abundance Estimation), FAO Manuals in Fisheries Science No. 5. Edited by S. T. Forbes and O. Na-ken. Food and Agriculture Organization of the United Nations, Rome, Italy, 1972; viii + 138 pages, illus. \$4.00. Sold in the United States by Unipub, Inc., 650 First Avenue, P.O. Box 433, New York, NY 10016.

Acoustic methods for fish finding and commercial fishing operations have been a regular feature of most developed fishing fleets for over 20 years. Many advances and improvements have been made to enable the fishermen to use acoustic sounds and sonars to increase his catches and improve his chances of success. The use of these instruments for research by scientists, however, has only recently become commonplace.

This book covers the use of these instruments by fisheries scientists in making population estimates independently of fishery statistics of catch and effort and tagging experiments, and methods for rapid exploration of unexploited stocks. Increasing emphasis is being placed on the problems of direct and speedier estimation of fish populations, and methods of sizing and counting fish with echo-sounders and sonars. A summary of the state of knowledge in the use of acoustics for fisheries resource survey and appraisal is the principal purpose of this book. It aims at giving the fisheries scientist a thorough understanding of the basic theory involved in his use of underwater acoustics and in the more precise application of echo-sounders and sonars for abundance estimation. But it is not intended as a handbook on fish counting.

The book is divided into five sections. Section I deals with the physical

properties of sound in water: its propagation and reflection from targets. Discussed are propagation of sound, formation of sound waves, sound intensity, reflection of sound in water, echo level, and target strength of fish. Section II discusses the structure and functioning of sonar equipment, and presents information on the basic features of sonar equipment, the echo sounder, the paper recorder, phasing, transmitter unit, transducers, and other details. Section III covers the identification of targets and characteristics of echo records. Section IV deals with abundance estimation and includes single fish echos, sampling volume, mean echo strength, multiple echos and scattering layers, vessel grading of echo recordings, and counting and sizing of echo recordings. The fifth and last section presents new developments in sonar techniques—gives some idea of the possibilities which might be within reach in the near future for estimating the amount of fish (in weight or number) within an area.

A preliminary version of the present book was issued in 1969 as FAO Fisheries Technical Paper No. 83—**"Manual of Methods for Fish Stock Assessment. Part 5. The Use of Acoustic Instruments in Fishing Detection and Fish Abundance."** It was based on the **"Report of the Fourth Session of the Advisory Committee on Marine Resources Research, 16-21 January 1967. Report of the ACMRR Working Party on Direct and Speedier Estimation of Fish Abundance,"** FAO Fisheries Reports No. 41, Suppl. 1. The preliminary book was used

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as the basis for lectures at several training centers. The present book is based on the experience gained at those centers and many parts have

been updated to include the most recent developments and techniques. The large and international list of contributions gives an indication of

the extent of this revision. This book will be a valuable asset to any fishery scientist and biological state engaged in population dynamics.

Monthly Fishery Market Review

July '73: Tightening Supplies and Higher Prices

The overall situation in the U.S. fishing industry during July was one of tightening supplies and generally higher prices. Only the major ground-

fish species supplies (Table 1) were significantly above the previous year. As a result of the shortening supplies, prices (Table 2) rose during the month for many species of fish and shellfish.

Table 1.—Groundfish supplies (fillet weight, in million pounds), July 1973. Groundfish include cod, flounder, haddock, and ocean perch.

	MAY 1973	JUNE 1973	JULY 1973	JULY 1972	Percent Change	JAN — JULY 1973	Percent Change
--- Million Pounds ---					Percent	Million Pounds	Percent
Beginning Inventory	31.1	34.5	42.6	17.8	+139	52.4	+16
Landings, Total	6.7	6.7	4.6	6.2	-25	37.9	-8
Imports	25.4	33.9	25.9	25.6	+1	174.1	+19
Total Supply	63.2	75.1	73.1	49.6	+47	264.4	+14
Ending Inventory	34.5	42.6	47.5	27.0	+76	47.5	+76
Consumption	28.7	32.5	25.6	22.6	+13	216.9	+6

Table 2.—Groundfish prices (wholesale, FOB Boston, Gloucester, and New Bedford), July 1973.

	MAY 1973	JUNE 1973	JULY 1973	JULY 1972	Percent Change	JAN — JULY 1973	Percent Change
--- Cents Per Pound ---					Percent	Cents Per Pound	Percent
COD							
Ex-vessel ¹							
Wholesale	13.1	14.3	18.9	17.3	+9	19.9	—
1 lb. Canadian	62.0	66.1	68.1	56.4	+21	61.3	+12
5 lb. Canadian	59.6	63.5	64.0	55.9	+14	57.0	+5
Retail ²	174.5	170.6	170.0	124.0	+37	178.4	+37
FLOUNDER							
Ex-vessel ¹							
Yellowtail	18.30	15.78	19.90	17.64	+13	23.97	+19
Lemonsole	24.84	28.57	52.00	39.09	+33	43.25	+12
Greysole	19.08	19.17	29.17	22.93	+27	29.11	+14
Blackback	17.91	18.48	30.02	25.07	+20	27.36	-2
Wholesale							
5 lb. domestic	95.7	85.6	87.5	95.0	-8	94.4	+6
5 lb. Canadian	80.2	80.0	81.8	66.3	+23	79.7	+36
Retail ²	224.0	216.6	219.4	170.3	+29	189.5	+16
HADDOCK							
Ex-vessel ¹							
Large	44.5	40.8	49.5	42.4	+17	45.8	+11
Scrod	32.2	21.3	22.9	32.3	-29	27.2	-18
Wholesale							
5 lb. Canadian	79.5	79.9	83.7	73.4	+14	79.3	+27
Retail ²	128.7	132.2	133.6	105.3	+27	125.0	+21
OCEAN PERCH							
Ex-vessel ¹	7.5	7.5	7.6	5.7	+33	7.4	+37
Wholesale							
5 lb. domestic	63.0	59.3	58.0	46.3	+25	59.2	+51
5 lb. Canadian	55.4	55.5	55.8	43.1	+29	53.8	+39
Retail ²	96.9	99.6	99.8	75.2	+33	94.3	+28

¹ Quotes taken at Boston, MA

² New York Consumer Market Reports

³ Bureau of Labor Statistics—average of 36 U.S. cities.

BLOCKS, STICKS, AND PORTIONS

Fish sticks and portions producers continue to face a serious block shortage; even astronomical prices have not succeeded in attracting greater imports (Tables 3 and 4). Producers appear to be trying to build inventories of blocks in the absence of additional imports by cutting back severely on summer production of sticks and portions (Tables 5 and 6). Supplies of raw material are, nevertheless, well below last year and replacement prices for blocks are soaring—up to 69 cents per pound for cod in July with no signs of letting up.

With the price freeze over, producers are in a position to pass on block price increases; thus, we expect to see a sudden bulge in stick and portion prices when the blocks purchased this summer at higher costs go into production. U.S. production of blocks has risen sharply since last year, but this still represents a minute percentage of U.S. block requirements. The outlook for increased production of sticks and portions this fall, given the current block shortage, is bleak.

GROUND FISH FILLETS

Supplies of major groundfish fillets (cod, flounder, haddock, and ocean perch) are still well above last year,