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National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northeast Fisheries Center
Woods Hole, Massachusetts 02543

September 14, 1983 F/NEC: JAG

To: Laboratory Directors, F/NEC*

Thru: Allen E. Peterson, Jr.
Center Director, F/NEC

From: Jon A. Gibson
Center Information and Publications Officer, F/NEC

Subject: Center Monthly Highlights

Beginning immediately and continuing indefinitely, the informational items submitted by Division Chiefs to the Center Planning Officer for the "NOAA Monthly Program Review" will be compiled, edited, and returned to Laboratory Directors as the "Northeast Fisheries Center (Monthly) Highlights." Laboratory Directors shall make the necessary number of photocopies to assure that each Center scientific and technical staff employee at his facility receives a copy.

Attached is the first issue.

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NORTHEAST FISHERIES CENTER
AUGUST 1983 HIGHLIGHTS

NEW CENTER DIRECTOR

Allen E. Peterson, Jr., formerly the Regional Director of the Northeast Region has been appointed new Center Director. Mr. Peterson has broad experience in recreational and commercial fisheries management. He has served for four years as Regional Director and, prior to that, Director of the Massachusetts Division of Marine Fisheries. He has also served as member and Chairman of the New England Fishery Management Council. Mr. Peterson graduated from the University of Massachusetts with Bachelor's (Wildlife Management) and Master's (Wildlife and Fishery Biology) Degrees, and has done further graduate work in Biology and Statistics. Mr. Peterson was recently appointed by the President as a Commissioner of the newly formed North Atlantic Salmon Conservation Organization.

REDFISH STILL DECLINING

A redfish stock assessment is to be completed and released by the end of September. This assessment shows the redfish stock in the Gulf of Maine-Georges Bank region at record low abundance and continuing to decline. One large year class is being recruited to the fishery, but is being heavily fished at a younger-than-usual age. All other year classes within the fishery are very low in abundance.

SQUID YIELDS COULD INCREASE

A yield-per-recruit analysis of *Loligo* sp. squid has been completed. This is the most detailed yield analysis of this species conducted to date. This analysis compares yield strategies from foreign and U.S. domestic fishing with yield from the U.S. fishing alone. The analysis concludes that yield is greater when the species is harvested inshore by U.S. fleets rather than offshore by foreign fleets and inshore by U.S. fleets. This occurs because of the combination of rates of growth and mortality, and the timing of the fisheries.

COD & HADDOCK LARVAE GROWING SLOWLY

The RNA-DNA ratio values for Atlantic cod and haddock larvae collected on the spring process-oriented cruise were generally lower than the values observed in 1981, indicating slower growth. Fairly large differences in RNA-DNA ratio values of haddock larvae were observed between stations. Corroborating growth curves using otolith daily ring increments have also been calculated from the same material.

MAJOR REPORT ISSUED ON BIVALVE MOLLUSKS

A significant publication on East Coast bivalves was issued in August. Authored by Roger Theroux and Roland Wigley, the publication is entitled "Distribution and Abundance of East Coast Bivalve Mollusks Based on Specimens in the National Marine Fisheries Service Woods Hole Collection," and was issued as NOAA Technical Report NMFS SSRF-768. The 172-page publication deals with geographic distribution from Florida to Nova Scotia of 225 different taxa of bivalve mollusks, and presents data on bathymetric ranges and sediment preferences. Notations of zoogeographic affinities are also included. A major feature is the referenceing of the original description of each species.

CONGRESS LOOKS AT CANCER IN FISH

Three staff members of the Fisheries and Wildlife Conservation and the Environment Subcommittee of the U.S. House of Representatives Committee on Merchant Marine and Fisheries visited the Oxford Laboratory on August 18 to be briefed on cancer and tumors (neoplasia) in fish. Discussed were some concerns of Congress on the relative frequency of these conditions in aquatic species and the adverse effects on fisheries and trade. An overview was provided by the Oxford staff that described several epizootics (epidemics) indicating high levels of neoplastic conditions in fish and other species from degraded/polluted environments. It was emphasized that epizootic neoplasia have been observed in aquatic species from areas not known to be degraded or highly polluted and, conversely, highly contaminated areas are known where neoplasia have not been observed.

UNDERSEA RESEARCHERS CONCLUDE SUMMER CRUISES

The Manned Undersea Research and Technology Program recently completed 35 days of sea duty in four back-to-back cruises involving lobster tagging in the central Gulf of Maine, a preliminary evaluation of the ghost gill-net problem, and submersible studies of Gulf of Maine lobster habitats and Georges Bank and allied canyon habitats within and downstream of oil and natural gas drilling areas.

GROWTH OF AQUACULTURED BAY SCALLOPS VARIES BY SITE

A cooperative investigation of the comparative growth of bay scallops in different locations in three northeastern states has been renewed. We are interested in determing both where and why scallops grow best, since this will have a major impact on the product yield from an aquaculture industry for this species. Preliminary data from last year's study showed considerable growth variation between sites, including surprisingly good growth in some areas that have no natural scallop populations.

MAINE PROCESSORS TO RECOVER WASTE ENERGY

The owner of several fish processing plants in Maine, alarmed at rising operation costs, has expressed interest in the recovery of waste energy from his canning and freezing operations. Dan Baker and Bob VanTwuyver will coordinate our assistance by analyzing each plant and recommending cost-effective recovery system or systems.

SATELLITE DATA AVAILABLE

Satellite-derived data have been prepared for identifying ecologically coherent areas in the Gulf of Maine-Georges Bank area. These data have been archived and are available to research institutions in the region.

REMOTE SENSING PROGRAM REPORT AVAILABLE

The NEARSS (Northeast Area Remote Sensing System) Association First Annual Report is available from Helen Mustafa. The NEARSS Association, composed of 12 institutions including the Center, was created to provide timely access to remotely sensed data and convenient access to processing facilities.

FISHERIES FALLOUT FROM SOVIET SHOOTDOWN

A request for four Center staff to attend a Northwest Atlantic Fisheries Organization symposium on recruitment to be held in Leningrad, USSR, has been withdrawn because of the Korean Airlines incident. Soviet-U.S. bilateral agreements on joint fisheries research in the North Atlantic were to be discussed at the meeting. The viability of such bilateral arrangements are, of course, now subject to high-level policy review.

CENTER INVOLVED IN ANTARCTIC RESEARCH

Richard Hennemuth and Kenneth Sherman attended the annual meeting of the Commission for the Conservation of Antarctic Marine Living Resources and its Scientific Committee in Hobart, Australia. A working group on data collection and handling was formed, and Mr. Hennemuth was appointed as Chairman. Specification of required data is a priority of the Scientific Committee. A meeting of the working group is to be held in Woods Hole next June. (Several Center personnel will participate in cruises of the Second International Biomass experiment (SIBEX) in Antarctic waters this year.)

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NORTHEAST FISHERIES CENTER
OCTOBER 1983 HIGHLIGHTS

MARMAP ESTIMATE OF SILVER HAKE BIOMASS

A fishery-independent estimate of the adult spawning biomass of silver hake was recently derived from eggs collected on seven MARMAP plankton surveys in 1979. Spawning began in late March, increased through June, and reached peak intensity during the first two weeks of July. Thereafter, it declined through October, but did not end until mid-December. Eggs occurred throughout the MARMAP survey area, which extends from Cape Hatteras to the Scotian Shelf, but the center of spawning activity was located on Georges Bank. During the course of the spawning season, 48.8×10^{12} eggs, or 39.6% of the total, were spawned on the Bank. Southern New England contributed 33.8%, followed by Gulf of Maine and Middle Atlantic Bight waters with 18.6% and 8.1%, respectively. On the basis of this calculation and length-frequency data of adults obtained from Center bottom trawl surveys, the spawning biomass was estimated at 212.6 $\times 10^3$ metric tons. Contact Wallace Smith (FTS-342-8260).

STOCKING THE OCEAN WITH COD DISCUSSED AT ICES MEETING IN SWEDEN

During the October 10-14 sessions of the ICES Mariculture Committee (Statutory Meeting, Gothenburg, Sweden), it was reported that Norwegian efforts at large-scale commercial production of Atlantic cod have been successful enough to consider the likelihood of overloading the ecosystem with the cultured cod. The French are also engaged in serious culture of several marine fish species as well, and are involved with the genetics and breeding of oysters in keeping with their large-scale efforts at restocking oyster beds. There is a growing appreciation of the value to fishery science of information provided through long-term culture of marine organisms under controlled conditions. Four papers by Center staff were presented to the Mariculture Committee dealing with: prospects for improvement of oyster growth rates through selective breeding; development of chromosome engineering techniques for shellfish culture; water quality, diseases, and culture of shellfish; and an overview of current U.S. activities in aquaculture genetics and genetics of wild aquatic resources. Fishery scientists, in particular those aquaculturally oriented, are beginning to make applications of the new procedures of DNA technology. Contact Dr. Arlene Longwell (FTS-642-5207).

NMFS SYSTEMATICIST ELECTED PRESIDENT OF ESTUARINE RESEARCH FEDERATION

Dr. Austin Williams has been elected President of the Estuarine Research Federation (ERF) for the 1983-85 biennium. ERF held its 1983 research meeting in Virginia Beach, Virginia, during October 22-26, where about 700 estuarine scientists and agency representatives heard over 250 formal papers, viewed poster sessions, and participated in workshops. Speakers addressing the general theme, "The Estuary as a Filter," were grouped into subdivisions treating physical, chemical, geological, and biological processes, and estuarine management. Both invited and contributed papers by domestic and foreign speakers will be published in peer-reviewed conference proceedings and in supplements to the ERF journal, *Estuaries*.

The ERF is composed of five regional estuarine research societies in the United States: Northeast, Atlantic, Southeast, Gulf, and Pacific. The membership of 1800 includes representatives from Canada and Mexico as well as a few overseas members. This meeting is the sixth biennial conference that has been held since the ERF was formed in 1971. The ERF has published each of the conference proceedings as peer-reviewed volumes sold by Academic Press, a number of special symposia, and its regular journal, *Estuaries*. ERF is managed by a governing board composed of officers elected at large, elected regional society representatives, and appointed officers. The next biennial meeting will be held on the University of New Hampshire campus in Durham, during July 29-August 2, 1985. Contact Dr. Bruce Collette (FTS-357-2552).

ALIPHATIC HYDROCARBONS AT HIGH LEVELS ALONG CENTRAL MAINE COAST

Forty-four sediment samples were analyzed for aliphatic hydrocarbons. They ranged from tridecane to pentacosane (C_{13}-C_{25}). Alkanes with odd numbers of carbons were present in larger amounts than even-number carbon compounds. Higher-than-average hydrocarbon levels were found in the Belfast/Sears Island/ Penobscot River area to the north. This corresponds with the high levels of polynuclear aromatic hydrocarbons found in that area. Contact Robert Learson (FTS-837-9313).

PUBLICIZING TECHNOLOGY FOR WASTE-ENERGY RECOVERY FOR FISHING VESSELS

A *NOAA Technology Brief* has been prepared by the NOAA Office of Research and Technology Applications. This brief was prepared from a recent Center publication on "Recovery of Waste Energy in a New England Fishing Vessel." The purpose of the brief is to make information more widespread, and to make potential users aware of the "know how" that exists in NOAA. Contact Robert Learson (FTS-837-9313).

U.S. AND CANADA JOINTLY STUDY OZONE DETOXIFICATION OF PSP-AFFECTED CLAMS

For the past year, a cooperative experiment between the Center and the Canadian Department of Fisheries and Oceans has tested the feasibility of ozone detoxification of paralytic shellfish poison in living soft-shelled clams (*Mya arenaria*) found in the Bay of Fundy. In the past, blooms of *Gonyaulax excavata* were responsible for making this clam unusable during quarantines of one or two months. Recently, however, cysts of *G. excavata* located in sediments adjacent to commercial shellfish beds have caused high enough toxicity levels to close many areas year-round. The last experiment of this series was completed in New Brunswick during September. Contact Dr. Walter Blogoslawski (FTS-642-5235).

EMPHASIS ON NATIONAL COORDINATION OF SHELLFISH TRANSPORT CONTROLS

During the Atlantic States Marine Fisheries Commission meeting during October 24-27, a program for shellfish health and inspection for the entire Atlantic Coast was a major topic of discussion. Also discussed was the possible future integration of shellfish transport control mechanisms with other sections of the country (Gulf and Pacific Coasts). The Atlantic Coast States plan to form a special shellfish transport committee to look into these questions. Contact Dr. Aaron Rosenfield (304-226-5193).

UPDATE ON IMAGE-ANALYSIS SYSTEM FOR ZOOPLANKTON RESEARCH

A prototype image analysis system for counting, measuring, and identifying of zooplankton has been developed as a joint research effort of the Narragansett Laboratory and the University of Rhode Island (URI), and is now undergoing testing and evaluation. In its present configuration, it can analyze up to four samples per hour, identifying plankton to major taxonomic group. Although this unique, custom-built system is the most advanced device of its sort, we are cooperating with researchers in Japan, the Federal Republic of Germany, and France who are undertaking similar projects. The German and French efforts have been directed toward adaptation of commercially available image analyzers, the same first step we took more than three years ago. The Japanese, on the other hand, are experimenting with the use of color to improve image contrast and identification.

Research directed toward the development of a more powerful system continues. Both URI and NMFS are cooperating on a project, funded jointly by the National Science Foundation and the Office of Naval Research, which will use a laser-optical computer for the instantaneous processing of zooplankton images. Ultimately, this will be part of a shipboard image analyzer for the real-time counting, measuring, and species identification of zooplankton. Contact Dr. Kenneth Sherman (FTS-838-7142).

FISH SCALES ELEVATE CALCIUM LEVELS IN FISH MINCE

Calcium determinations made on mince from various parts of three species of fish indicated that unintentional inclusion of fish scales into the mince is mainly responsible for elevating calcium levels. Also, mince from Atlantic cod frames had the highest level of cholesterol, about 25 mg/100 g mince. Contact Robert Learson (FTS-837-9313).

METHODS TO DETERMINE THE MINCED PROPORTION OF MINCE-FILLET FISH BLOCKS

Drafts of two papers on methods for determining the amount of minced fish in a mixed mince-fillet fish block were written. The first paper reported on the preliminary screening of four methods in terms of practicality. The second paper reported on the results of the examination by three different people of lab-prepared five-pound fish blocks with three levels of minced fish. Contact Robert Learson (FTS-837-9313).

For more information on the above items, contact the name and number within the item, or the Center's Information & Publications Office (FTS-840-1228 or 617-548-5123 x 228).

NORTHEAST FISHERIES CENTER
NOVEMBER 1983 HIGHLIGHTS

DIRECTORY OF CONSERVATION INFORMATION & EDUCATION PERSONNEL

A directory listing names, titles/activities, mailing addresses, and telephone numbers of 500 key information and education (I&E) professionals within U.S. and Canadian federal agencies responsible for fish, wildlife, forest, and grassland conservation has been prepared and sent to the printer. This directory, the first of its kind, includes 11 U.S. and six Canadian agencies, and is designed to promote interagency communication and cooperation among I&E personnel. Copies will be distributed in late December to those listed in the directory and to 500 other key I&E professionals within U.S. and Canadian state/provincial conservation agencies.

This project is a NMFS commitment through its membership and involvement in the Association for Conservation Information (ACI). The ACI membership is composed of 55 U.S. and Canadian state/provincial/federal conservation agencies and six private conservation-oriented organizations. Contact Jon Gibson (FTS-840-1228 or 617-548-5123).

ILLEX SQUID ABUNDANCE DOWN

The 1983 *Illex* squid stock assessment was completed and the assessment report was released in late November. This assessment shows the *Illex* stock in the Gulf-of-Maine-through-Mid-Atlantic area at its lowest abundance since 1974. Research vessel survey indices in 1982 and 1983 were well below the 1975-81 average. Sharp declines in both catch and abundance estimates for *Illex* off Canada during 1979-82 also indicate substantial reductions in this stock. Any further reduction in abundance would warrant reevaluation of the present 30,000 metric ton optimum yield. Contact Anne Lange (FTS-840-1301 or 617-548-5123).

NORTH SEA HERRING REBOUND--PREDATOR INTERACTIONS IMPLICATED (WILL GEORGES BANK FOLLOW?)

The International Council for the Exploration of the Sea's (ICES) Herring Assessment Working Group reported during their October 1983 meeting that recent recruitments to North Sea herring stocks increased those stocks to approximately 300,000 metric tons from a "commercially extinct" level during the mid-to-late 1970's. The cause of the rebound is not clear. However, the hypothesis that predator interaction among sand eels, herring, and mackerel was the cause was enhanced by reports in the ICES Biological Oceanography Committee that linked the decline in North Sea sand eels to the rapid recovery of North Sea herring.

In lab studies, Danish scientists showed a predatory preference for herring larvae by 12-cm sand eel juveniles. The Danes also reported a rapid (15-30 minutes) digestion rate of the herring larvae. In contrast, the Norwegian scientists reported excellent survival (70%) for herring held in predator-free enclosures. (These results showed remarkable agreement with Center studies showing 70% survival for flounder larvae in predator-free enclosures.)

These ICES reports support our hypothesis relating the decline of Georges Bank herring to the population explosion of sand eels off the Northeast. The

Center will continue to monitor any change in the Northeast's sand eel population in relation to any recovery of Georges Bank herring. Contact Dr. Kenneth Sherman (FTS-838-7142 or 401-789-9326).

NORTHERN SHRIMP CONTINUE SLOW COMEBACK IN GULF OF MAINE

A recent assessment by the Center, the Maine Department of Marine Resources, the New Hampshire Fish and Game Department, and the Massachusetts Division of Marine Fisheries indicates a continued gradual recovery of the Gulf-of-Maine northern shrimp stock. This resource collapsed in the mid-1970's, apparently due both to adverse environmental conditions and to heavy exploitation. Abundance has since stabilized and now appears to be increasing under seasonal closures, mesh-size regulations, and other management measures imposed by the Atlantic States Marine Fisheries Commission. Center surveys suggest a continued gradual increase since the late 1970's, although abundance remains considerably below levels observed during the peak years of the late 1960's. Landings during the 1983 season (December 15, 1982 - May 15, 1983) are down to 1,400 metric tons from 1,500 the previous year, apparently due, at least in part, to changes in availability associated with warmer inshore temperatures. Contact Dr. Stephen Clark (FTS-840-1312 or 617-548-5123).

PLANNING FOR POLISH RESEARCH FISHERY FOR OVERWINTERING ATLANTIC MACKEREL

For the fourth consecutive year, the Center will cooperate with the Polish Sea Fisheries Institute in Gdynia and the GRYF Deep Sea Fishing Company in Szczecin in conducting a research fishery for Atlantic mackerel. This program will involve two Polish factory trawlers working between Georges Bank and Cape Hatteras from mid-January to the end of April. Principal objectives will be to monitor the age structure of overwintering mackerel and define their geographical distribution during that period. Final arrangements are being made with Polish authorities.

The Polish research vessel *Wieczno* will also return in February for survey work on Atlantic herring, Atlantic mackerel, and apex predators--marking the 13th year of cooperative fishery research between the Center and the Sea Fisheries Institute. Contact Dr. Emory Anderson (FTS-840-1251 or 617-548-5123).

SPANISH MACKEREL MONOGRAPH TO BE PUBLISHED IN *FISHERY BULLETIN*

A monograph describing and distinguishing the 18 species of Spanish mackerels (*Scomberomorus*) of the world by systematists Bruce B. Collette and Joseph L. Russo has been accepted for publication in the NMFS journal, *Fishery Bulletin*. This paper will facilitate identification of the Spanish mackerels, many species of which are important to recreational and commercial fisheries, and will stabilize the names used for them. Synonymies, maximum sizes attained, distributions, and summaries of both biology and fisheries importance are included with each species account. Contact Dr. Bruce Collette (FTS-357-2524 or 202-357-2524).

US AND JAPAN DISCUSS AQUACULTURE OF SALMON, SCALLOPS, CRAYFISH, 'GATORS, ETC.

The 12th meeting of the United States-Japan Cooperative Program in Natural Resources' Aquaculture Panel was held in Baton Rouge, Louisiana, in

late October. This Panel oversees the exchange of scientists and literature between the two countries and arranges for joint cooperative projects.

Activities presently include: an agreement for the supply of one million chum and pink salmon eggs for each of three years from Japan for culture in Maine waters as an experimental venture with National Science Foundation support; the residence in Japan of two U.S. scientists; and plans for four Japanese scientists to undertake research at U.S. institutions during 1984.

This meeting's theme--Reproduction, Maturation and Seed Production of Cultured Species--was highlighted by 20 papers presented by Japanese and U.S. scientists, including one on bay scallop aquaculture research by the Center. Several field trips were scheduled to aquaculture facilities along the Louisiana Gulf Coast where the commercial culture of oysters, crayfish, and alligators was observed as practical examples of commercial aquaculture operations.

The Japanese reported that aquaculture production in Japan now contributes 8.5% of the total fisheries production of the country. Two of the important fish species have reached significant levels of production--yellowtail (*Seriola* sp.) at 150,000 metric tons, and sea breams (primarily *Pagrus* sp.) at 20,000 metric tons. Scallop production is over 100,000 metric tons (live weight) annually or approximately 12,000 metric tons of meats, which is greater than the U.S. production of sea scallop meats from our natural fishery.

The next meeting of the panel will be held in Japan at the Nansai Regional Fisheries Laboratory. Contact Edwin Rhodes, Jr. (FTS-642-5226 or 203-783-4200).

CENTER ASSISTS MASSACHUSETTS WITH ACID RAIN RESEARCH

The Commonwealth of Massachusetts is testing all bodies of water within the state for the effects of acid rain. Analytical chemists at the Center's Gloucester Laboratory are helping by determining the pH and total alkalinity of samples from waters in northeastern Massachusetts. Gloucester Laboratory employees are not what you would call strictly unaffected observers--all five reservoirs providing drinking water to the City of Gloucester are now classified as "endangered" due to acid rain. Contact Robert Learson (FTS-837-9313 or 617-281-3600).

DIVERS FIND LITTLE HARM FROM ACID-WASTE DISPOSAL OFF NORTHERN NEW JERSEY

Divers made visual observations and videotapes, and took bottom samples, to determine effects of acid-waste disposal at a site 15 nautical miles east of the northern New Jersey coast. The dives were made shortly after a dump of acid wastes, and flocculating waste particles (mostly iron hydroxide) were abundant in the water column and on the bottom. However, there were no obvious differences in the health of the biota, and only minor differences in abundance of animals, at the acid site compared to a reference site 7 miles to the northeast. Contact Robert Reid (FTS-342-8220 or 201-872-0200).

NO PARALYTIC SHELLFISH POISON CYSTS FOUND OFF NEW JERSEY

A cooperative survey with the New Jersey Department of Environmental Protection has not yet detected resting cysts of the single-celled alga *Gonyaulax excavata* in New Jersey waters, although cysts and vegetative cells

of this species have recently been reported to be common in nearby Long Island, New York, waters. *G. excavata* creates a toxin which can accumulate in tissues of shellfish feeding on the alga. If the shellfish are then eaten by humans, paralytic shellfish poisoning (PSP) can result, and can be fatal. Large areas of shellfish beds in Gulf-of-Maine coastal and estuarine waters have occasionally been closed due to detection of the toxin in shellfish, and there is some evidence that the condition is spreading south. However, there is an apparent reduction in toxicity from north to south, and PSP has not yet been found south of Narragansett Bay, Rhode Island. Contact Robert Reid (FTS-342-8220 or 201-872-0200).

CENTER COSPONSORS SYMPOSIUM ON POLLUTION PHYSIOLOGY

The Center, with the Belle W. Baruch Coastal Research Institute and the University of South Carolina's College of Public Health, cosponsored the sixth biannual symposium on "Pollution and Physiology of Marine Organisms" at Mystic, Connecticut, during November 1-3. Some 90 scientists from throughout the United States, as well as Scotland and the People's Republic of China, attended the sessions, which were oriented towards physiological effects of pollutants on commercially and recreationally important marine species. The thirty-two invited and contributed papers will be published by the University of South Carolina Press in a peer-reviewed conference proceedings.

Information exchanged at such meetings is valuable for Center research planning and direction, particularly for environmental assessment. In particular, one area of pollution research emphasized the mechanisms of detoxification of pollutants by marine organisms, pointing out that at least some animals can cope with pollutant stress as part of their routine metabolism. Contact Dr. Anthony Calabrese (FTS-642-5205 or 203-783-4200).

DATA REFINED FOR FROZEN SHELF LIFE OF ATLANTIC COD FILLETS

Some of the only data available on shelf life of frozen fillets is based on fish obtained from trip vessels where the fish could have been held on ice anywhere from one day to two weeks prior to obtaining them. Since the quality of such fish varies considerably by an unknown amount prior to their being processed and preserved, the resulting shelf-life data are suspect at best. To refine such product quality data, the Center obtained Atlantic cod from day vessels, held the fish on ice for 1, 6, or 9 days, and stored the fillets from them at +10°, 0°, or -10°F. Observations so far are shown in the table below:

Shelf life (in months) of Atlantic cod fillets frozen and stored at +10°, 0°, or -10°F, after being cut from fish held on ice for 1, 6, or 9 days.

Storage temperature	Days on ice: 1	6	9
+10°	2	2	2
0°	>4	>4	~3
-10°	>4	>4	~3

Contact Joseph Mendelsohn (FTS-837-9282 or 617-281-3600).

NEW STANDARDS FOR GRADES OF SHRIMP DUE OUT IN COUPLE OF MONTHS

A public meeting was held in Atlanta, Georgia, on November 30 to receive comments on the new revised standard for grades of all forms of fresh and frozen shrimp, except breaded ones. The Nation's major shrimp processors and the National Fisheries Institute were represented. It was a smooth, productive meeting; the new revised standard should be out in a couple of months. Contact John Ryan (FTS-837-9248 or 617-281-3600).

For more information on the above items, contact the name and number within the item, or the Center's Information & Publications Office (FTS-840-1228 or 617-548-5123 x 228).

S. Chang ~~Shellenbarger~~

NORTHEAST FISHERIES CENTER
DECEMBER 1983 HIGHLIGHTS

RECREATIONAL FISHERMEN VOLUNTARILY PROVIDE BLUEFISH CATCH AND EFFORT DATA

With help and encouragement from Dr. William Muller, Managing Editor of *Fishermen Magazine*, and the constituency he represents, we have undertaken a voluntary bluefish data collection system. Since September 1983, we have been receiving monthly catch-per-unit-of-effort data on a size category basis from five Long Island surf fishing clubs. To date, information has been received on almost 700 individual fishing days accounting for the capture of over 1,700 bluefish ranging in size from 1 to 20 pounds.

Over time this endeavor should provide timely information which will be invaluable to us concerning the recreational removal of bluefish. In addition, during recent conversations with representatives of recreational user groups, it was felt this is just the beginning of what has the potential for a long-term cooperative venture which can be expanded not only geographically, but also to additional species (striped bass, weakfish, summer flounder, etc.). Contact Stuart Wilk (FTS-342-8236 or 201-872-0200).

POTENTIALLY OUTSTANDING COD YEAR CLASS ON GEORGES BANK

The young-of-the-year index for the Georges Bank stock of Atlantic cod from the Center's 1983 autumn research vessel survey was the second highest in the 21-year survey time series. This suggests potentially outstanding recruitment of the 1983 year class. Only the young-of-the-year index for the exceptional 1975 year class was higher than the 1983 value. Contact Dr. Fredric Serchuk (FTS-840-1245 or 617-548-5123).

MACKEREL STOCK REBUILDING

The recently completed 1983 Atlantic mackerel assessment indicates continued recovery from the 1981 low point. International catches have remained fairly stable since 1978; the 1978-83 average catch was 31,400 metric tons (MT) compared to a peak value of 430,400 MT in 1973 when distant-water fleet activity was greatest. Reported U.S. commercial catch in 1982 was 3,300 MT, the highest since 1970; the projected 1983 value is slightly higher.

Recent stock recovery is based largely on improved recruitment, with the 1982 year class estimated to be the strongest since 1974. The 1980 and 1981 year classes also appear to be stronger than any others since 1974. Spawning-stock biomass has increased from about 300,000 MT in 1981 to a projected 563,000 MT at the beginning of 1984; however, this level remains well below the 1,600,000 MT peak value in 1971. A projected catch in 1984 of 132,000 MT (based on $F_{0.1}$ fishing mortality) will still result in a three percent increase in spawning stock biomass in 1985. Contact Dr. Emory Anderson (FTS-840-1251 or 617-548-5123).

HIGH BUTTERFISH DISCARD IN 1983

Significant quantities of young-of-the-year butterfish were discarded by the U.S. trawl fishery during 1983. Based on data collected by Center port agents, discard averaged 50 percent (by weight) of the landed catch during the last half of 1983, compared to an estimated 10 percent in previous years. One

reason for the high discard is that harvesters have found it difficult to avoid the small fish. The recently completed 1983 butterfish assessment indicates that the 1983 year class is the largest observed in the 1968-83 time series. Except for 1982, all other year classes have been strong during the last five years. Despite high discard, estimated total landings (U.S. and foreign plus discard) in 1983 declined 23 percent from the 1982 value. Contact Gordon Waring (FTS-840-1311 or 617-548-5123).

ROCK SHRIMP STUDY COMPLETED, INFORMATION TO BE SOON PUBLISHED

A monograph on the 12 species of rock shrimps (genus *Sicyonia*) occurring in the American Pacific was completed and submitted for publication to the NMFS *Fishery Bulletin*. Until a few years ago, rock shrimps were discarded from the large commercial catches of penaeoid shrimps made in both the eastern Pacific and western Atlantic. It was commonly thought that, because of their hard shells, they would be rejected by the consumers and the processing industry; however, increased demand for shrimp encouraged the fishermen and dealers to bring the larger of these species to market, and now the production is readily absorbed. Two species are well known: the ridgeback prawn (*S. ingentis*) on the West Coast and the brown rock shrimp (*S. brevirostris*) on the East Coast.

The monograph is based on the study of over 4,000 specimens. It contains a key to the species together with descriptions and color notes--color pattern being an infallible feature for field identification. Information on reproduction, habitat, and maps of the range of each species (six of which are extended beyond limits previously reported) are included, as well as present or potential economic value. Contact Dr. Isabel Canet (FTS/202-357-1417).

ICELAND SCALLOP BEDS SURVEYED

Since autumn 1982, a fishery for Iceland scallops has been developing on beds located southeast of Chatham, Massachusetts. Special sampling of these beds was conducted during August 1983, as part of the Center's sea scallop survey, to obtain baseline biological information on this resource. Survey results indicated that major concentrations exist in an area east-southeast of Pollock Rip Channel at depths of 30-40 fathoms. A broad size range of individuals exists within the beds, suggesting that the resource is comprised of at least 10 age groups, and that several strong year classes occur within the population. Contact Dr. Fredric Serchuk (FTS-840-1245 or 617-548-5123).

SURVIVAL OF GEORGES BANK COD AND HADDOCK LARVAL POPULATIONS NOT LIMITED BY PREY

Center scientists are working with stochastic models to assess the starvation and predation of Atlantic cod and haddock larvae in the Georges Bank spawning and nursery areas. Preliminary conclusions are: (1) starvation-caused mortality is undoubtedly one of the largest, if not the largest, components of total mortality in early life; (2) starvation-caused mortality is most significant in the first 2-3 weeks after hatching; (3) haddock are more food-limited than cod by a factor of approximately four; and (4) starvation-caused mortality, though, does not appear to be population limiting or the single catastrophically controlling mortality factor under normal prey densities. Contact Dr. Geoffrey Laurence (FTS-838-7142 or 401-789-9236).

CENTER'S PORT AGENTS TO USE COMPUTERS FOR DATA TRANSFER

The processing of commercial fisheries landings statistics has finally entered the 20th century. The high stools, green visors, and quill pens are being replaced by computer terminals in Center field offices at major ports. These terminals will be directly linked to the VAX computer in Woods Hole, facilitating rapid transfer of data to and from the field. Port agents are being trained intensively in data entry, auditing, and data retrieval using software assembled by Center personnel. This program is currently in operation at the Boston and Cape May offices. Contact Darryl Christensen (FTS-342-8241 or 201-872-0200).

NMFS/URI COOPERATIVE FISHERIES ENGINEERING UNIT SETS 1984 GOALS

Agreement has been reached between these two groups for cooperative projects during the coming year. They are: (1) both model and full-scale tests of various trawl doors; (2) fuel consumption tests; and (3) underwater observations of trawls. Contact Alan Blott (401-792-6888).

NEW TEST FOR IDENTIFYING CLAM TUMORS

A new diagnostic test system that uses mouse supplement cell cultures for the production of antibodies that act against clam tumor cells has recently been developed by Dr. Carol Reinisch and her colleagues at the Tufts University School of Veterinary Medicine. This research was done under a contract from the Center and should permit identification and quantification of clams with tumors along the northeastern United States and other coastal areas. The test is very specific and essentially is the same as that used in human medicine to diagnose for the presence of disease organisms and unique types of cells. Contact Dr. Aaron Rosenfield (301-226-5193).

COOPERATIVE RESEARCH IN SHELLFISH PATHOLOGY

Problems in shellfish pathology, particularly those related to MSX and neoplasia in mollusks, were recently discussed by biologists from the Center, the State of Maryland, and the University of Maryland. The use of monoclonal antibodies and other approaches for diagnosing disease organisms and pathologic conditions were reviewed. Also, field and laboratory research activities of these three institutions have been integrated as part of a memorandum of understanding and cooperative agreements signed several months ago. Contact Dr. Aaron Rosenfield (301-226-5193).

STANDARDIZED DISTRIBUTION FOR ENVIRONMENTAL ASSESSMENT INFORMATION

The Environmental Assessment Division has established a standardized distribution system so that technical memoranda, published papers, and other documents can be routinely distributed to key management personnel and other users. The list includes regional Environmental Protection Agency personnel, U.S. Army Corps of Engineers personnel, and state conservation agencies. Environmental and conservation organizations receive material as appropriate. Recent materials distributed include the 106-Mile Site characterization update, papers on contaminants in Penobscot and Casco Bays, papers on trace metals and PCB's in finfish, a paper on the relationship between ocean dumping and distribution of PCB's, and a paper on benchmark

distribution of phytoplankton and possible relationships to eutrophication of coastal and estuarine waters. Contact Dr. John Pearce (FTS-342-8205 or 201-872-0200).

RETORT POUCHES TROUBLESOME BUT EFFECTIVE FOR FISH PROCESSING

Several attempts were made to process fish and shellfish in retort pouches. In each attempt, although the products tasted very good, the pouches had broken during the heat processing in the retort. This problem could be due to our pouch sealer that is not too reliable or to the retort not holding the overriding pressure properly. Contact Robert Learson (FTS-837-9313 or 617-281-3600).

COMBINED RADIATION AND POTASSIUM SORBATE TREATMENT FOR PRODUCT PRESERVATION

An investigation of the effect of ionizing radiation (200 krads) and a potassium sorbate dip (5.0 percent) on the rate of microbial deterioration of a New Zealand fish, the orange roughy (*Hoplostethus atlanticus* of the family Trachichthyidae), has been completed. Dr. Don Burns, a visitor from New Zealand to the Center's Gloucester Laboratory, began this study to determine how the roughy would respond to the two treatments. Analysis of the microbial data and taste-tests results is currently being performed. Contact Robert Learson (FTS-837-9313 or 617-281-3600).

PROPORTIONS OF FILLET AND MINCE IN SUCH PRODUCT MIXTURES

We participated in a collaborative study on the determination of proportions of fillet pieces and minced fish in fish cores containing a mixture of both. The other collaborators are members of the West European Fisheries Technologists Working Group for Analytical Methods. The study was organized by the Federal Research Center for Fisheries in Hamburg, Germany. Contact Robert Learson (FTS-837-9313 or 617-281-3600).

For more information on the above items, contact the name and number within the item, or the Center's Information & Publications Office (FTS-840-1228 or 617-548-5123 x 228).

Gibson

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts 02543

JANUARY 1984

CATALOG OF TUNAS AND MACKERELS PUBLISHED BY FAO

FAO has published an annotated and illustrated catalog which is a worldwide inventory of all 49 representatives of the family Scombridae. It is aimed primarily at individual workers and institutions concerned with scombrid fisheries. The catalog is a source of wide-ranging basic information by species, and is relevant to all aspects of systematics, biology, and fisheries. Identification keys, distribution maps, and illustrations are provided for each species. It is the second in a series of worldwide species catalogs produced by FAO. It was written by Bruce B. Collette (National Systematics Laboratory) and Cornelia Nauen (FAO). Contact Dr. Bruce Collette (FTS/202-357-2524).

AT-SEA SAMPLING ON COMMERCIAL VESSELS EXPANDED--DATA TO BE USED IN ASSESSMENTS

The Center expanded its commercial sea-sampling program during January. A minimum of 26 trips are proposed for 1984, covering the area from Maine to Virginia. Trips will be undertaken on vessels from the major and some minor New England and Middle Atlantic ports. Vessel captains and/or owners are being invited to participate.

Assessment scientists and port agents will be placed aboard such vessels to collect information during fishing operations. This program will obtain detailed catch-and-effort data on a per-tow basis. Length measurements and age samples of fish discarded at sea, as well as the marketable catch, will also be obtained. Such information will be used in developing fish stock assessments. Contact Thurston Burns (FTS-840-1309 or 617-548-5123).

US-POLAND RESEARCH FISHERY FOR OVERWINTERING ATLANTIC MACKEREL UNDERWAY

Two Polish factory trawlers (*Admiral Arciszewski* and *Kniozik*) departed Boston on January 6 to begin a research fishery for Atlantic mackerel. This cooperative fishery has been conducted annually since 1981 by the GRYF Deep Sea Fishery Company (Szczecin), the Sea Fisheries Institute (Gdynia), and our Center. Periods of intensive searching alternate with routine fishing operations. Aboard each vessel a Polish and a Center scientist/technician collect data.

By the first port call in New York (January 25), the vessels had located and fished on mackerel from off northern New Jersey to the mouth of Chesapeake Bay. The initial catch of these vessels totaled about 1,800 metric tons. The two vessels will be permitted to take a total of 5,000 metric tons of mackerel in the conduct of the research activity. Work is expected to be completed by late March or early April. Contact Dr. Emory Anderson (FTS-840-1251 or 617-548-5123).

WITCH FLOUNDER FISHERY INTENSIFIES--MAINTAINING RECENT CATCH LEVELS QUESTIONABLE

A recent stock assessment for witch flounder in the Gulf of Maine indicates a substantial increase in exploitation of this resource. Landings have increased from an average of 3,300 metric tons during the late 1970's and early 1980's to 5,100 metric tons in 1982; landings for 1983 are expected to approximate 7,000 metric tons. To a large extent, these increased landings reflect development of a combined fishery for witch flounder and American plaice during warmer months, and by-catch in other fisheries (such as northern shrimp) in which effort has been increasing. Also, the abundance indices from the Center's research vessel surveys have declined since 1981. This downward trend implies a significant increase in fishing mortality.

Harvests of 5-6,000 metric tons during the early 1970's were followed by declines in abundance and biomass, and in reduced landings; it is therefore questionable whether recent catch levels can be sustained. Contact Dr. Stephen Clark (FTS-840-1312 or 617-548-5123).

GEORGES BANK FISHES: MAN CATCHES 10-15%; OTHER FISH, SQUIDS, WHALES, & BIRDS CATCH REST

A study was completed by Center staff on the productivity of Georges Bank compared with other high-latitude shelf ecosystems, for all trophic levels from phytoplankton to whales. Production of fish per unit of area on Georges Bank is higher than in other North Atlantic regions, and comparable to fish production in the East Bering Sea.

Most of the fish production on Georges Bank is consumed by natural predators, including other fish, squids, whales, and birds; only about 10-15 percent of the total fish production appears to be available to man on a sustainable basis. Contact Dr. Marvin Grosslein (FTS-840-1252 or 617-548-5123).

ALGAL BIOASSAYS SHOW NITROGEN USUALLY THE LIMITING NUTRIENT ON THE NORTHEASTERN SHELF

Assay of 23 samples completed a long-term algae assay study of the relative scarcity of phytoplankton nutrients on the Northeast shelf. Statistical analyses of assay results, which identify nitrogen to be most critical in this respect, are near completion. Contact John Mahoney (FTS-342-8255 or 201-892-0200).

FISH DISEASE SURVEY METHODS TO BE STANDARDIZED

Key staff with the Center's research-vessel survey program participated in an ICES-sponsored cruise and workshop which focused on methods of fish disease surveys. Some perceived differences in disease prevalence were shown to be only a function of variations in data collection, disease diagnosis criteria, and data evaluation. Practical work with the catches and discussions of the results of these exercises were carried out in addition to the formal presentation of prepared papers. A final report on standard procedures for conducting a disease survey will be submitted as an ICES document. Contact Linda Despres-Patanjo (FTS-840-1346 or 617-548-5123).

LECTURES ON MARINE FISH DISEASES ADDED TO USFWS'S FRESHWATER FISH DISEASES COURSE

For the first time, the six-month "long course" on freshwater fish diseases at the U.S. Fish and Wildlife Service's National Fisheries Academy has included lectures on diseases of marine fishes. On January 19, the Center's Dr. Robert Murchelano delivered two lectures on the etiology and pathogenesis of infectious diseases in economically important marine fishes. The lectures presented detailed morphological and biochemical information on a large variety of microbial and metazoan parasites, and also included in-depth descriptions of the histopathology produced by the pathogens discussed. The lectures were well received, and it is anticipated that in succeeding years the long course will include more presentations on marine fish diseases. Contact Dr. Robert Murchelano (301-226-5193).

NEW MONITORING OF HYDROCARBON POLLUTANTS IN GULF OF MAINE SEDIMENTS

A new monitoring study is underway to obtain baseline levels of sediment-bourne chlorinated and petroleum hydrocarbon pollutants from sites in Casco Bay and the Gulf of Maine. The specific pollutants are aromatics, alkanes, alkenes, polynuclear aromatics, and isoprenoids. Contact Donald Gadbois (FTS-837-9286 or 617-281-3600).

SEABED OXYGEN CONSUMPTION RATE IN NEW YORK BIGHT APEX UNCHANGED SINCE 1974

Studies have shown that the seabed oxygen consumption rate--a measure of the decomposition of organic matter--for the New York Bight, as a whole, has not changed significantly since a 1974-75 investigation, despite a general trend of declining consumption rates during this period. Seabed oxygen consumption has lowered significantly in response to decreased dredge-spoil dumping. This decrease, however, has been offset by increased rates of oxygen consumption in sediments impacted by increased sewage-sludge disposal. Contact William Phoel (FTS-342-8215 or 201-872-0200).

NO RED-TIDE-CAUSING DINOFLAGELLATES YET FOUND OFF NEW JERSEY

Our cooperative survey with the New Jersey Department of Environmental Protection for the red tide dinoflagellate *Gonyaulax excavata* in New Jersey did not detect vegetative cells in the Navesink and Shrewsbury Rivers or cysts in the Atlantic City area. On these occasions, we used a hand-pumping system for water and sediment collections which is a favored method by New England and New York investigators. Contact Dr. James Thomas (FTS-342-8246 or 201-872-0200).

GROWTH OF SURF CLAMS IN BOTTOM CAGES HAS AQUACULTURE POTENTIAL

Hatchery-produced surf clams (*Spisula solidissima*) of various sizes have been reared subtidally at various densities in wire-mesh cages. Cages were 60 cm x 60 cm x 35 cm, had either 1.25 or 0.75-cm mesh openings, were placed either nearshore (2 meters deep at mean low water) or offshore (75 meters deep at mean low water), and were partially buried in the natural seabed, allowing the clams to burrow. (cont.)

Clams smaller than 35 mm in length showed no reduction in growth at planting densities up to 2,000 per square meter. At lengths greater than 34 mm, clams grew most rapidly at a planting density of 500 per square meter. Growth was related to temperature as influenced by depth. Clams at shallow, nearshore sites grew most rapidly between May and September when seawater temperature was higher than at deeper offshore sites. Conversely, from September to November, growth at shallow sites ceased, while it continued at deeper sites where temperature was warmer. No significant difference in growth was found between clams in cages with 0.75 and 1.25-cm mesh openings.

Survival rates of the caged clams exceeded 90 percent. Predators were effectively excluded from the cages, and biofouling was minimal at all sites. Growth results suggest that one-season, intensive cage culture of surf clam seed can be a viable grow-out method to produce 50-mm clams for the commercial market. Contact Edwin Rhodes, Jr. (FTS-642-5226 or 203-783-4226).

CHEMICAL COMPOSITION OF ALGAE AFFECTS THEIR NUTRITIONAL VALUE TO JUVENILE AMERICAN OYSTERS

Studies were completed on the gross chemical composition of two closely related algal flagellates that differ in nutritional value for juvenile American oysters (*Crassostrea virginica*). The first algal species had a considerably smaller dry weight per cell, but contained higher percentages of protein and carbohydrate. The second species contained a significantly higher percentage of lipid.

In oyster feeding studies conducted with several other algal species, dry weight of algae has not correlated with nutritional value. It is likely that differences in the chemical compositions of these two algal species could explain the differences in their food values. Contact Dr. Ravenna Ukeles (FTS-642-5223 or 203-783-4223).

SORBATE TREATMENT EXTENDS SHELF LIFE OF BLUE CRAB MEAT

We have reported previously that sorbates can preserve fresh fillets as long or longer than irradiation. We have now found that a 2.5 percent potassium sorbate solution can extend the shelf life (at 34°F) of blue crab meat by 28 percent over non-dipped controls. Contact Vincent Ampola (FTS-837-92285 or 617-281-3600).

U.S. STANDARDS FOR GRADES OF SHRIMP BEING TOTALLY REVISED

Proposed U.S. Standards for Grades and draft Instructions concerning fresh or frozen fish steaks, fresh or frozen fillets, fillet blocks, minced fish blocks, frozen fish portions and fish sticks, fresh or frozen freshwater catfish, and fresh or frozen shrimp are being prepared. Based upon comments received at a recent industry meeting, the shrimp standard is being completely revised. Contact John Ryan (FTS-837-9248 or 617-281-3600).

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FEBRUARY 1984

FOOD-DEPRIVED STRIPER LARVAE RAPIDLY BECOME BLIND; MORE VULNERABLE TO STARVATION & PREDATION

Although starvation per se may not be a major factor in survival of certain offshore larval fish species (e.g., Atlantic cod, haddock), it may be a major factor for those spawning in nearshore and estuarine environments that have been changed by man. Our experiments with newly hatched but food-deprived striped bass larvae have clearly shown degenerative and pathological changes in the neural and non-neural portions of the eye as early as five days after hatching. The conversion of striped bass larvae from endogenous (yolk) to exogenous (prey) feeding during their first week after hatching is considered "critical" to their survival. Rapid onset of limited vision in food-deprived striped bass larvae may increase their chances of starvation or predation by other fish species. Contact Dr. Joel Bodammer (301-226-5193).

HERRING LANDINGS ON THE DECLINE

The Gulf of Maine's Atlantic herring fisheries have sharply declined within the last two years. Landings in the coastal Maine juvenile herring fishery declined from 48,200 metric tons (mt) in 1981 (the highest catch since 1963) to only 18,200 mt in 1983. This decline is believed attributable both to reduced availability of juvenile herring to the fixed-gear fisheries, and to reduced recruitment. Similar declines occurred in the Jeffreys Ledge adult herring fishery, where landings declined from 36,200 mt in 1980 to only 4,300 mt in 1983. Here, declining abundance, changes in availability, and a weak export market associated with recovery of European herring stocks all appear to have contributed to the decline in landings.

Both Center and Massachusetts Division of Marine Fisheries (MDMF) research-vessel survey results indicate decreased abundance of herring during the last several years. No improved recruitment has been found in Maine Department of Marine Resources larval herring surveys or in MDMF estuarine seine surveys in which "brit" (age 1) herring have been routinely collected. A recently completed Center winter survey will be used to evaluate relative abundance of herring as a supplement to these alternative survey methods. Contact Gordon Waring (FTS-840-1311 or 617-548-5123).

CAN LENGTH OF FROZEN STORAGE IMPROVE LENGTH OF ICED STORAGE AFTER THAWING?

We have found what appears to be a progresive reduction in the bacterial content of frozen Atlantic cod fillets over a six-month storage period. This reduction prolonged the iced shelf life of the cod fillets when thawed, commensurate with the length of time the fish had been frozen. Contact John Kaylor (FTS-837-9275 or 617-281-3600).

SHARK TAGGING ON INCREASE; TAGGING NEWSLETTER ALMOST READY

Just like the East Coast recreational shark fishery--now 22 million pounds annually--the NMFS Cooperative Shark Tagging Program is growing. In 1983, a record 5,860 fish representing 29 shark species and seven teleost (bony fishes) species were tagged under the program. The principal species tagged were blue, sandbar, dusky, and mako sharks. A record 186 tags were also recaptured from 19 shark species by fishermen from 13 countries. Recaptures included: blue sharks after 2.3 years at liberty and over distances of nearly 1,800 miles, sandbar sharks after a record 17.6 years and over nearly 2,000 miles, and a tiger shark over a record 1,900 miles from New York to Costa Rica.

This and other information on food habits, age & growth, and distribution have been summarized for our 1983 newsletter, "The Shark Tagger," which will be sent to 2,500 cooperators next month. Contact John Casey (FTS-838-7142 or 401-789-9326).

PREY AVAILABILITY TO JUVENILE BLUEFISH MAY INFLUENCE STOCK RECRUITMENT

During 1981 and 1983 we investigated the relationship between feeding and growth of juvenile bluefish in Sandy Hook Bay, New Jersey, an important nursery area for this species. Stomach contents from fish sampled in 1981 showed that juveniles fed predominantly on fishes, including Atlantic silversides, bay anchovy, mummichog, and striped killfish. In contrast, during 1983 the juvenile bluefish were consuming plankton in June, but were consuming crustaceans and fishes by September. Comparison of growth/condition between the two year classes of juvenile bluefish showed that, generally, growth was highest when consumption of fish prey was also highest. The results suggest that a lack of certain prey, specifically silversides and anchovy, may limit growth/condition of juvenile bluefish during their first year, and ultimately reduce survival and subsequent recruitment to the fishery. Contact Anne Studholme (FTS-342-8279 or 201-872-0200).

HADDOCK ASSESSMENT MARKS CONTINUED DECLINE

The Center has released an updated assessment of the Georges Bank and Gulf of Maine haddock resource. Results for Georges Bank indicate a continued decline in abundance since the brief period of recovery in the late 1970's. Landings have declined from 27,500 mt in 1980 to only 12,600 mt in 1983; stock biomass estimates and research-vessel survey indices declined by over 70 percent during the same period. The 1984 catch is expected to be substantially less than 10,000 mt. A reversal of this trend is unlikely before 1986 at the earliest, since research-vessel survey indices for recent year classes are very poor.

The outlook for the Gulf of Maine stock is brighter, although abundance appears to be lower than in former years. Landings in the last several years have averaged around 6,500 mt and will probably remain near this level in 1984. Future prospects appear better since the 1979, 1980, and 1982 year classes seem relatively strong. Contact Dr. William Overholtz (FTS-840-1256 or 617-548-5123).

U.S. DELEGATION GARNERS OFFICIAL APPOINTMENTS WITHIN NEW SALMON CONSERVATION ORGANIZATION

Representatives of several nations from both sides of the Atlantic gathered in Edinburgh, Scotland, during January 16-20 for the inaugural meeting of the North Atlantic Salmon Conservation Organization (NASCO). The purpose of NASCO is to promote the conservation, restoration, enhancement, and rational management of salmon stocks in the North Atlantic Ocean. NASCO is composed of a Council and three Regional Commissions which are responsible for developing scientific research programs and regulatory measures to reduce the interception of salmon by offshore foreign fisheries.

The U.S. delegation was composed of three Commissioners to NASCO (Allen Peterson, Frank Carlton, and Richard Buck), as well as government advisors and scientists. At the meeting, Peterson was appointed as Vice President of NASCO's Council, and Buck was appointed as Vice Chairman of the North American Regional Commission. The next meeting is again in Edinburgh beginning May 22. Contact Arthur Neill (FTS-840-1350 or 617-548-5123).

ONLY ONE-DAY-FRESH COD KEEP QUALITY AFTER SIX MONTHS OF FROZEN STORAGE

The experiment to determine the frozen-storage stability of Atlantic cod that had been stored on ice for 1, 6, or 9 days prior to freezing is continuing. All frozen samples were rated as unacceptable after six months of storage at +10°, 0°, and -10°F, except for the one-day-iced sample stored at -10°F. This sample is still acceptable after eight months of storage. Instron, texture, and Hunter L color measurements of the samples are continuing. Contact John Kaylor (FTS-837-9275 or 617-281-3600).

For more information on the above items, contact the name and number within the item, or the Center's Information & Publications Office (FTS-840-1228 or 617-548-5123 x 228).

NORTHEAST FISHERIES CENTER

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Woods Hole, Massachusetts 02543

MARCH 1984

U.S. BUTTERFISH CATCH HIGH, DISCARD A MAJOR PROBLEM

Landings of butterfish by U.S. fishermen during January-February totalled 5,600 metric tons (MT), the highest ever for the U.S. winter fishery. (The record *yearly* total for U.S. landings was 8,900 MT in 1982.) In addition, the record high discard rates of age 0 butterfish observed during August-December 1983 appear to be continuing into 1984. Estimates of present discard are about 30-50 percent of the landed catch. These high discard rates result from the strong 1983 year class and the decreased abundance of older, larger butterfish.

The development of a new "supersmall" market category has encouraged an intense fishery on small butterfish, but has also helped to maintain the high discard rates, as not all small fish are acceptable in the new market category. The large catches of small butterfish will result in lost yield and reduced recruitment to the spawning stock. Contact Gordon Waring (FTS-840-1311 or 617-548-5123).

NEW AND POTENTIALLY SERIOUS DISEASE FOUND IN SOFT CLAMS

We recently applied a new method of disease diagnosis--using histocytologic preparations of molluscan blood--to soft clam and blue mussel samples from several sites along the Northeast and Mid-Atlantic States. The diagnosis revealed a possibly new species of haplosporidian parasite in the blood of 3 of 50 clams from Sandwich, Massachusetts. These three blood-based diagnoses were verified histologically. Gross lesions which contained plasmodia of this parasite also occurred in gill tissue of nine of these clams. We estimate a disease prevalance of 20 percent in this population. This parasite is a potentially serious pathogen of clams; it's morphologically similar to *Haplosporidium nelsoni*, the oyster pathogen associated with mass mortalities along the Mid-Atlantic States. Contact Austin Farley (301-226-5193).

NEW LOW-ENERGY PROCESS TO CONVERT FISH WASTES TO FERTILIZER

The fish-waste byproducts generated during fish processing are a potential source of marine pollution if discharged into the marine environment, but are a potential source of livestock feed or agricultural fertilizer if converted into fish meal. Such conversion, though, involves dehydration which involves high energy use.

The Center has just developed a method which produces fish silage acceptable for agricultural fertilizer within 48 hours and with little energy expenditure. The silage produced by this "formic acid process" will be tested by the Essex (Massachusetts) Agricultural Institute to evaluate its agricultural potential. Contact Vincent Ampola (FTS-837-9285 or 617-281-3600).

BOTTOM INVERTEBRATE POPULATIONS IN NORTHEAST ARE STABLE OVER TIME

As part of NOAA's Northeast Monitoring Program, Center scientists have sampled small bottom-living invertebrates such as clams, snails, crustaceans, and polychaete worms at 25 stations on the Northeast continental shelf each summer and winter since 1978. Populations of these animals are monitored because they are: (1) often the most useful indicators of biological effects of environmental change, both natural and man-induced; (2) important prey for commercially and recreationally valuable species; and (3) a source of contamination for those species. For nine of the stations, we could compare our findings with earlier data collected by other investigators, going back as far as 1955 for the Buzzards Bay station.

Based on a comparison of such ecological parameters as species diversity, community structure, etc., we find that inshore stations, particularly those in the New York Bight's Christiaensen Basin and Upper Hudson Shelf Valley, have been and remain the most stressed. Populations in these two areas have not been much further altered since the early 1970's, however. The other stations used in the comparison are not becoming more like the Bight ones, or otherwise showing signs of increasing stress, even though there has often been considerable variability in their ecological parameters. Contact Robert Reid (FTS-342-8220 or 201-872-0200).

U.S.-POLISH MACKEREL RESEARCH FISHERY BENEFITTING U.S. INDUSTRY

The U.S.-Polish cooperative research fishery for Atlantic mackerel which began in early January is nearing completion. Two Polish factory trawlers, *Admiral Arciszewski* and *Kniazik*, have conducted searching and fishing operations primarily between New Jersey and North Carolina, but have gone as far north and east as Georges Bank. Mackerel have been found throughout the New Jersey-North Carolina area, and catches through the end of March have totalled about 4,600 metric tons. The two Polish trawlers have benefitted some U.S. trawlers that are fishing for mackerel and participating in joint ventures with East German and Dutch trawlers, by providing information to the U.S. trawlers on fish location and fishing methods. Contact Dr. Emory Anderson (FTS-840-1251 or 617-548-5123).

FEASIBILITY OF ECOSYSTEM-LEVEL FISHERIES MANAGEMENT TO BE PROMOTED

The Center and the University of Rhode Island will convene a symposium on the "Variability and Management of Large Marine Ecosystems" at the annual meeting of the American Association for the Advancement of Science at the New York Hilton on May 28 and 29. The three sessions will deal with: (1) impact of perturbations on productivity of renewable resources in large marine ecosystems (LME's); (2) measuring variability in LME's; and (3) the institutional framework for managing LME's. The symposium should establish the feasibility of ecosystem-level management of renewable marine resources. The NOAA Administrator will address symposium participants at a May 28 dinner. Those interested in attending or obtaining more information should contact Alice DeNofa (FTS-838-7143 or 401-789-9326).

CENTER ASSISTS SHELLFISH AQUACULTURE DEMONSTRATION PROJECT

The Center is providing information on shellfish aquaculture technology to the Urban Development Corporation (UDC) of New York. The UDC has received one-million dollars from New York State to initiate a shellfish aquaculture demonstration project on eastern Long Island. Natural shellfish harvests have drastically declined in this area. The UDC plans to train unemployed baymen in aquaculture techniques, provide them with the appropriate gear and shellfish seed to begin production, and eventually market the shellfish through a fishermen's cooperative. The current plan would involve about 50 baymen by 1985. Contact Ed Rhodes (FTS-642-5226 or 203-783-4200).

HABITAT MONITORING NOW EMPHASIZES INSHORE WATERS, FOCUSES ON FEWER SPECIES

Since 1978, NOAA's Northeast Monitoring Program (NEMP) and its NMFS predecessor, the Ocean Pulse Program, have been establishing baselines and seeking trends in the health of resource species and their habitats on the continental shelf between Cape Hatteras and Canada. At the just-completed NEMP annual program review, it was decided to emphasize inshore waters in the future since the program has not found major contaminant problems on the middle and outer shelf, and to focus on fewer species in assessing factors affecting health and contaminant burdens of fisheries resources.

The first such "case study" will involve winter flounder; a workshop is being planned to review what is known about this species and what informational gaps remain to be filled. Candidate species for future case studies include red hake, surf clam, ocean quahog, bluefish, and American lobster. A summary report on findings and plans discussed at the program review will soon be available through Dr. John Pearce (FTS-342-8206 or 201-872-0200).

CONGRESS HEARS TESTIMONY ON DEPLETED EAST COAST STRIPER STOCK

On March 20, the House Subcommittee on Fisheries and Wildlife Conservation and the Environment heard testimony on a bill introduced by Representative Claudine Schneider of Rhode Island. The bill calls for a three-year moratorium on the catch, sale, or possession of striped bass from North Carolina to Maine. The bill is intended to reduce fishing morality on this depleted stock. Among those testifying on the bill was the Center's Dr. John Boreman, who described the current production and fisheries for striped bass off the Northeast and Mid-Atlantic States. Contact Dr. John Boreman (FTS-840-1225 or 617-548-5123).

SHELLFISH AQUACULTURE WORKSHOP HELD FOR COMMERCIAL AND RESEARCH FACILITIES

The Center hosted a one-day shellfish aquaculture workshop at the Milford Laboratory for 33 people from 17 commercial and research facilities in the Northeast and Mid-Atlantic States. Topics included: the different nutritional values of two algal species as food sources for juvenile American oysters; an overview of disease incidences in ten hatcheries with suggested control measures; the aquaculture potential of bay scallops and surf clams; feeding regimens which could significantly improve seed production; and application of genetic (including recombinant DNA, cell & embryo manipulations, and cryopreservation) to improving hatchery rearing procedures. Contact Dr. Walter Blogoslawski (FTS-642-5235 or 203-783-4240).

For more information on the above items, contact the name and number within the item, or the Center's Information & Publications Office (FTS-840-1228 or 617-548-5123 x 228).

NORTHEAST FISHERIES CENTER

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APRIL 1984

NORTH AMERICAN-SPAWNED ATLANTIC SALMON BEING HEAVILY OVERFISHED

To assist the U.S. Commissioners to the new North Atlantic Salmon Conservation Organization in developing management proposals for Atlantic salmon, Center scientists have: (1) summarized available information on Atlantic salmon fisheries; (2) reviewed the status of Northwest Atlantic salmon stocks; and (3) contracted research on ways to determine the proportion of U.S.-spawned Atlantic salmon in the catch off eastern Canada and West Greenland. Although many more data need to be analyzed, those data which have been analyzed confirm that North American-spawned Atlantic salmon are being heavily overfished off both West Greenland and Newfoundland/Labrador. Contact Dr. Vaughn Anthony (FTS-840-1304 or 617-548-5123).

LONG ISLAND SOUND'S CAPACITY FOR BAY SCALLOP AQUACULTURE BEING EXPLORED

We have begun a seven-month experiment on how phytoplanktonic prey are used by their shellfish predators within a three-dimensional aquaculture system. The experiment's results should allow us to predict the carrying capacity of certain areas of Long Island Sound for growing planted bay scallop seed to a marketable size. We have cultured 500,000 scallop seed (1-3 mm size) from a February and March spawning, and will soon deploy 200,000 of them (5-mm size) in the Sound in a cube-shaped array: Contact Edwin Rhodes (FTS-642-5226 or 203-783-4226).

PARASITES OF MACKEREL MAY HELP IN CONSERVATION OF MACKEREL

Atlantic mackerel have historically shown large population fluctuations. To determine how certain natural factors--as opposed to fishing--may influence these fluctuations, the Center began a joint study with the Polish Sea Fisheries Institute in 1982 to study the prevalence and significance of the blood parasite *Haematractidium scombri* in Northwest Atlantic mackerel. Observations to date show little effect by this parasite on mackerel populations.

However, there may be significant differences in the prevalence of this blood parasite, as well as the gill parasite *Kuhnia scombri*, between the two contingents (north and south) of the Northwest Atlantic mackerel stock. Accordingly, we are redirecting the study to see if *H. scombri* and *K. scombri* can be used as tracers or "tags" for each contingent, and thus help differentiate the contingents' seasonal distributions. With the mackerel resource recovering well from foreign overfishing in the late 60's and early 70's, the ability to determine the seasonal separation or mixing of the north and south contingents could help managers prevent disproportional harvests from these contingents, and thus help protect against future overfishing. Contact Sharon MacLean (301-226-5193).

GEORGES BANK GYRE VARIES ANNUALLY; MAY EXPLAIN SOME OF THE ANNUAL VARIATION IN LARVAL SURVIVAL THERE

The "leaky clockwise gyre" on Georges Bank has been called the salvation or damnation of the Bank's important fisheries resources: salvation if it retains fish larvae in the plankton-rich waters on the Bank, damnation if it removes them from the Bank. To document a missing link in our information on the gyre, we began last fall to study the influx of slope-region water and its plankton onto western Georges Bank through the Great South Channel. (Marianna Pastusak of the Polish Sea Fisheries Institute visited us in March and April to assist in this study.)

One result of the study is an indication that the influx of slope water, and likely the amount of recirculation of water around the Bank itself, varies significantly from year to year. Such annual variations in the amount of recirculation of water around the Bank may explain some of the annual variations we see in the feeding, growth, and survival of the Bank's fish larvae. Contact David Mountain (FTS-840-1271 or 617-548-5123).

CENTER PRESENTS FIRST-TIME COURSE IN MARINE ANIMAL DISEASES AT NATIONAL FISHERIES ACADEMY

Center scientists have presented a first-time, week-long course on diseases of marine finfish and shellfish to students of the U.S. Fish and Wildlife Service's National Fisheries Academy in Leetown, West Virgina. Lectures covered: specific diseases of marine fish, crustaceans, and mollusks; effects of these diseases on populations; diseases associated with pollution; public health aspects of animal diseases; and strategies for disease management. In the laboratory sessions, students learned practical techniques for handling and preserving specimens and diagnosing diseases. Contact Dr. Aaron Rosenfield (301-226-5193).

CENTER MICROBIOLOGIST ELECTED PRESIDENT OF NORTHEAST SHELLFISH SANITATION ASSOCIATION

Dr. Walter J. Blogoslawski was voted President-Elect of the Northeast Shellfish Sanitation Association (NESSA) during its April 25 annual meeting at Riverhead, New York. NESSA, a quasi-professional organization of Northeast shellfish researchers, public health officials, commercial shellfish harvesters, and federal fisheries authorities, provides a forum for exchanging information on quality improvement in marketed shellfish. Contact Dr. Walter Blogoslawski (FTS-642-5235 or 203-783-4235).

For more information on the above items, contact the name and number within the item, or the Center's Information & Publications Office (FTS-840-1228 or 617-548-5123 x 228).

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BOOK PUBLISHED ON ATLANTIC COAST SHRIMPS, LOBSTERS, AND CRABS

Shrimps, Lobsters, and Crabs of the Atlantic Coast of the United States, Maine to Northern Florida, by Austin B. Williams, was issued by the Smithsonian Institution Press in May. This book treats 342 species and includes a general introduction which discusses the systematics of the groups and analyzes their zoogeographic affinities. A general key to families is followed by family, subfamily, generic, and specific accounts, with keys to categories below family scattered through the text. Each species account includes abbreviated synonymy, recognition characters, figure(s), measurements, habitat, type-locality, and general remarks on life history and ecology. Selected references are cited. The book will be valuable as a general reference for stock assessments, food habits of predators studies, life history studies, ecological surveys, and geographic distribution studies, as well as a compendium of documented information on the species discussed. Contact Dr. Austin B. Williams (FTS/202-357-2639).

The book can be purchased from the Smithsonian Institution Press, 1111 N. Capital St., Washington, D.C. 20002, (202) 357-1793, for $35.00. Orders or questions should be directed to the Press.

BOOM AND BUST FOR THE YELLOWTAIL FLOUNDER FISHERY

Recent landings of yellowtail flounder have dropped significantly. According to the Northeast Regional Office's *Fishery Market News Report* issued out of Boston, 1984 landings--as of May 25--are 41 percent below the corresponding 1983 total. This apparent turnaround comes at the heels of a rapid expansion in the fishery wherein total annual landings increased 112 percent between 1981 and 1983. Southern New England landings increased from 4,900 tons in 1981 to 10,300 tons in 1982 to 17,000 tons in 1983. Georges Bank landings increased from 6,400 tons in 1981 to 10,600 tons in 1982 to 11,400 tons in 1983.

Increased 1982 and 1983 landings for these areas resulted both from recruitment of the strong 1980 year class, which accounted for over 50 percent of the total number landed in 1982, and from removal of quotas under the Interim Management Plan for Atlantic Groundfish. However, the level of fishing mortality was very high during 1982 and 1983, the rate of discarding the 1980 year class was high when recruited in 1982, and more recent year classes appear to be weaker than the 1980 year class, hence the recent drop in landings. Contact Margaret McBride (FTS-840-1246 or 617-548-5123).

DREDGE-SPOIL IMPACTS UPON BENTHOS MEASURED AT EASTERN LONG ISLAND DUMPSITE

Our multivariate statistical analyses of dredge-spoil disposal at the New London (Conn.) Dumpsite have shown benthic invertebrates at the disposal point to be immediately and severely impacted, but with recovery beginning shortly after dumping stopped. After 6-9 months of continuous dumping, major impacts extended at least 1/4 nautical mile "downstream" (southeast) from the disposal point; lesser impacts extended to or beyond 1/4 nautical mile "upstream" (northwest) from the disposal point. We detected no impacts more than 1/2 nautical mile away. Impacts may have been less that expected due to the dredged material being relatively uncontaminated preindustrial clays rather than more contaminated surface sediments.

Our analyses also showed that we could begin studying a subset of the 200 benthic species now being studied at the site, and still detect major impacts. The study may begin to deal with just these selected indicator species. Contact Robert Reid for data (FTS-342-8220 or 201-872-0200) and Dr. Sukwoo Chang for analyses (FTS-342-8267 or 201-872-0200).

NORTHERN SHRIMP FISHERY CONTINUES COMEBACK

Gulf of Maine northern shrimp landings for the December 1983-April 1984 season totaled approximately 3,000 metric tons or 6.5 million pounds. This is the highest total since 1975, and is double the 1982-83 average. This increase is thought to reflect both increased abundance (as evidenced by Center surveys) and a coastwide increase in fishing effort. For Maine, the number of vessels fishing for shrimp peaked at 238 in February 1984 as compared to 164 in 1983. For Massachusetts, the number of vessels peaked at over 40 vessels in 1984 as compared to 25 in 1983. Contact Dr. Stephen Clark (FTS-840-1243 or 617-548-5123).

PRODUCTION OF ATLANTIC HERRING LARVAE REMAINS LOW

The Center's MARMAP surveys have shown low production of Atlantic herring larvae during the 1982-83 spawning season in the once-productive spawning beds on Georges Bank. For the fifth consecutive year, we failed to catch a single larva over the eastern half of the Bank, or that part of the survey area where spawning was most intense during the 1950's and 1960's. Young herring were moderately abundant in the Massachusetts Bay area in both October and November, and around German Bank off western Nova Scotia in October; otherwise, their distribution was limited to scattered occurrences, mostly along the western edge of the Gulf of Maine. Young herring, 7-19 mm, occurred over the northwestern part of Georges Bank in November, but these larvae apparently originated in the Massachusetts Bay area. Contact Wallace Smith (FTS-342-8260 or 201-872-0200).

CLOSED SYSTEM SUCCESSFULLY USED TO CONDITION OYSTERS FOR SPAWNING

The Center has developed information on using a closed system to condition molluscan brood stock for spawning. In particular, this information could assist shellfish researchers and commercial hatchery operators who desire to breed or work with nonindigenous species or stocks which are restricted to quarantine conditions. Japanese oysters (*Crassostrea gigas*) were brought successfully through gametogenesis to sexual maturity for spawning within two months by thermal conditioning and feeding in a recirculating seawater system. Survival was high at greater than 95 percent. Periodic cytological examination of gonads confirmed the progressive advancement in gametogenesis. Spawning trials at weekly intervals also indicated the spawnability of these oysters. At the completion of conditioning, three of the females produced a total of 129 million eggs, an average of 43 million, in a single spawning. Viable gametes resulted in normal larvae. Contact Sheila Stiles (FTS-642-5224 or 203-783-4224).

UNDERSEA STUDY BEGINS ON NEW ENGLAND GILLNET FISHERY

The Center has begun the undersea phase of a planned three-year study of gillnetting in New England waters. The study stems from a 1982 request by the New England Fishery Mangement Council to the Center. The Council had been approached in 1982 by the Interstate Party Boat Association to look into competition among various users--trawlers, gillnetters, party boat operators, etc.--for the same species in the same areas. The Council felt, though, that not enough information was available on gillnetting in New England waters to adequately address the issue. Thus, the Council asked the Center to find out: (1) what kinds, amounts, and sizes of fish are caught by gillnets; (2) what happens to the fish after they're caught, but before they're hauled aboard the boat; and (3) to what extent lost or "ghost" gillnets might continue to catch fish?

Scientists from the Center, Massachusetts Division of Marine Fisheries (MDMF), University of Connecticut (UC), and University of New Hampshire (UNH) began a series of 27 dives on Pigeon Hill off Cape Ann, Mass., during late May, descending and ascending in a NOAA National Undersea Research Program diving bell--operated from the University of North Carolina at Wilmington's research vessel *Seahawk*--then using surface-supplied dive gear to study the nets. The MDMF's research vessel *F.C. Wilbour* is assisting the study by setting and hauling the gillnets, and making daily trips between Pigeon Hill and Rockport, Mass.

Following the late May cruise using the *Seahawk* for studies directed at tended gillnets, scientists from the Center, MDMF, UNH, UC, and Southeastern Massachusetts University will conduct a late June cruise using the Harbor Branch Foundation's (Fort Pierce, Fla.) research submersible *Johnson Sea-Link* for studies directed at ghost gillnets. Contact Dr. Alan Hulbert (FTS-840-1336 or 617-548-5123).

VOLUNTARY PARTY-BOAT LOGBOOKS LOOK PROMISING

A voluntary system for collecting party-boat fishery data using logbooks was cooperatively developed during summer 1983 by the Interstate Party Boat Association and the Center, and implemented on a trial basis during a five-week period in autumn 1983, to evaluate the merits of such a system in documenting party boat-gillnet interactions . A report recently completed by Center scientists indicates that the data collected were of high quality and broad utility in documenting party boat-gillnet interactions and in evaluating resource and fishery conditions. The data enabled resource analyses to be performed which would otherwise not have been possible. Contact Dr. Fredric Serchuk (FTS-840-1245 or 617-548-5123).

TWO CONFERENCES HELD ON FISH HEALTH AND DISEASE RESEARCH

Two important conferences on fish health and disease research sponsored by the National Marine Fisheries Service and cooperating organizations, were held during May. The first meeting, held on April 30 and May 1 at the Rutgers University Oyster Research Laboratory in Cape May, N.J., concerned infectious and pollution-related diseases in shellfish. Neoplastic diseases, viruses, and other infectious diseases were discussed by scientists from state and university organizations located on the Chesapeake Bay, Delaware Bay, and from New York and New England.

The other meeting, held in Boothbay Harbor, Me., during May 10-12, involved scientists from the United States, France, Norway, Finland, Scotland, Canada, and Denmark. In-depth reviews and reports on cancer-like diseases and virus diseases in finfish and shellfish were presented for both the East and West Coasts and northern Europe. Reports of both meetings should be available in several months. Contact Dr. Aaron Rosenfield (301-226-5193).

TRIPOLYPHOSPHATE ADDITIVES DON'T SPEED UP THAWING RATE OF FROZEN FISH BLOCKS

The National Fisheries Institute recently asked the Center about a view it heard that tripolyphosphate additives could speed up the thawing rates of frozen fish blocks--something that could enhance the marketability of fishery products. To test its own views on the effects of tripolyphosphate on the freezing and thawing of fish blocks, the Center experimented with three kinds of fish blocks: untreated, those with 10 percent added water, and those with 10 percent added water at a 12 percent tripolyphosphate level. Duplicate samples of each kind of block were frozen (0°F), thawed (38°F), refrozen, and rethawed (72°F). As expected, we detected no differences in the freezing or thawing rates of any of the samples. Contact Dan Baker (FTS-837-9269 or 617-281-3600).

OZONE DOESN'T YET SHOW ABILITY TO EXTEND SHELF LIFE OF FRESH COD

The Center has completed a second phase of its study on the use of ozone to extend the shelf life of fresh gutted Atlantic cod. We compared the spoilage of cod stored in slush ice which had been ozonated daily, with the spoilage of cod stored in ordinary slush ice. To mimic conditions on "trip vessels," we stored the fish in slush ice for seven days, then transferred them to flake ice for additional storage. Under these conditions, ozone doesn't show the ability to extend shelf life. Contact Elinor Ravesi (FTS-837-9287 or 617-281-3600).

CENTER SCIENTIST ELECTED PRESIDENT OF AMERICAN FISHERIES SOCIETY'S NORTHEASTERN DIVISION

Dr. Fredric M. Serchuk was voted President-Elect of the Northeastern Division of the American Fisheries Society (AFS) and installed during its May 14-16, 1984, Annual Meeting at Ocean City, Md. AFS, founded in 1870, is the oldest and largest professional society representing fisheries scientists. It promotes scientific research and enlightened management of aquatic resources for optimum use and enjoyment by the public. It likewise encourages a comprehensive education for fisheries scientists and continuing on-the-job training. Contact Dr. Fredric Serchuk (FTS-840-1245 or 617-548-5123).

For more information on the above items, contact the name and number within the item, or the Center's Information & Publications Office (FTS-840-1228 or 617-548-5123x228).

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JUNE 1984

SURF CLAMS ABUNDANT; LANDINGS AHEAD OF QUOTA

The quota on landings of surf clams from the Middle Atlantic was 1,180,000 bushels through June 30. Landings as of June 15, though, were 1,334,000 bushels--13 percent ahead of quota. Consequently, the Northeast Regional Office closed the Middle Atlantic fishery from June 24 to July 7. These ahead-of-quota catches are evidence of recruitment of the strong 1976 year class.

Landings from New England had nearly reached the quota of 100,000 bushels when Amendment 4 of the Surf Clam Fishery Management Plan, which became effective on July 1, raised the quota to 200,000 bushels. But, New England landings may even exceed 200,000 bushels due to a new fishery on Georges Bank which was not even considered in Amendment 4.

We found evidence of the concentration of surf clams on Georges Bank during exploratory fishing operations by NOAA's R/V *Delaware II*, but we have not yet been able to assess the total size of the Georges Bank resource. Therefore, the Georges Bank fishery will be an unrestricted fishery for up to 90 days for fishing vessels which cooperate with the Center in collecting data. Also, the Center will modify its annual summer surf clam research vessel survey to include greater coverage of Georges Bank. Contact Steven Murawski (FTS-840-1303 or 617-548-5123).

FLOUNDERS SHOWING EARLY SIGNS OF STRESS IN POLLUTED HABITATS

During a summer 1983 environmental survey of the Northeast's continental shelf, we collected several flounder species from both polluted and unpolluted habitats. We have just completed a biochemical analysis of these flounder samples for the levels of a kidney enzyme, "G6PDH." High levels of this enzyme indicate that an organism has encountered and is trying to cope with environmental pollutants, but before those pollutants have physiologically harmed the organism. When physiological harm occurs, the G6PDH levels plummet, as do many other physiological indicators.

For the summer 1983 samples, all yellowtail, winter, and windowpane flounders from unpolluted habitats had G6PDH levels of 42-63, well within the normal range of 35-70. However, between 25 and 100 percent of winter and windowpane flounder collected in the New York Bight apex, Buzzards Bay, Block Island Sound, and the mouth of Delaware Bay had G6PDH levels over 100, a level considered both statistically and biologically significant. Thus, in these latter habitats, which are subject to major pollution, a large percentage of the flounder are showing the initial response to environmental pollutants. Although we collected no yellowtail flounder in the polluted habitats during the summer 1983 survey, we have earlier found G6PDH levels in this species well over 100 when collected from the mouth of the Merrimack River and off Race Point, both in the polluted Massachusetts Bay.

Interestingly, the flounders in the polluted habitats were divided into two distinct groups--about 50-70 percent in a normal 38-59 range, and the remaining 30-50 percent in an exceptionally high 103-142 range. Apparently, some fish were longtime residents of the polluted habitats, others were newcomers. Contact Edith Gould (FTS-642-5222 or 203-783-5222).

BIOLOGICAL DATA ON BLUE CRAB PUBLISHED BY NMFS

The first issue in the new *NOAA Technical Report NMFS* series, which combined the old *NOAA Technical Report NMFS Special Scientific Report-Fisheries* and *Circulars* series, is a synopsis of biological data on the blue crab (*Callinectes sapidus*). This publication, also No. 138 in the *FAO Fisheries Synopsis Series*, reviews information on the species from over 300 reports published through 1982: taxonomy, morphology, distribution, life history, commercial hard and soft crab fisheries, physiology, diseases, ecology, laboratory culture methodology, and influences of environmental pollutants on the species. The most recent reported landings and value for this species (1983) were 191.7 million pounds and 55.1 million dollars. The report is coauthored by M.R. Millikan, formerly of the Southeast Fisheries Center's Charleston Laboratory, and A.B. Williams of the National Systematics Laboratory. Contact Dr. Austin Williams (202-357-2639).

FLOUNDER VIRUS MAY BE USEFUL VACCINE AGAINST TROUT VIRUS

Cooperative studies with the U.S. Fish and Wildlife Service have isolated a new strain of infectious pancreatic necrosis virus (IPNV). The new strain, designated "flounder strain," has been found in southern flounder, hogchoker, spot, and Atlantic silversides.

This flounder strain seems to be more similar to the European Ab strain of IPNV than to the North American salmonid or clupeid strains of IPNV, and seems to be avirulent (not harmful) to other fishes when they are exposed to it. Isolates of the flounder strain may become a useful vaccine for such fishes as the brook trout which has suffered mass mortalities to the salmonid strain of IPNV under hatchery conditions. Contact Martin Newman (301-226-5193).

JOINT AMERICAN AND SOVIET FISHERIES RESEARCH TO BE DOCUMENTED

In line with the June 27 announcement by President Reagan on the need for increased dialog and cooperation between scientific sectors of the United States and the Soviet Union, the Center will cooperatively produce a book on joint American and Soviet fisheries research since 1967 with the Soviet's All-Union and Atlantic Scientific Research Institutes for Marine Fisheries and Oceanography. We expect the book to be released during 1986 in both English and Russian editions. The Soviet Union will do all the translating; the United States will do the publishing.

Also planned are joint field studies during summer and fall 1986 on recruitment variability. A meeting is being considered for fall 1985 in Woods Hole to make detailed plans for the field studies, as well as to review progress on the book. Contact Richard Hennemuth (FTS-840-1238 or 617-548-5123).

ANTARCTIC CONSERVATION COMMISSION CONSIDERS DATA NEEDS FOR ASSESSING FISH & KRILL STOCKS

The Center hosted a June 11-16 meeting of an Ad Hoc Working Group on Data Collection and Handling of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). Twenty-five scientists from 11 member countries, the European Economic Community, and the United Nations Food and Agriculture Organization participated.

The working groups developed information on the kinds and amounts of data needed from the international fisheries in order to assess the Antarctic's fish and krill stocks. This information will be considered by the CCAMLR's Scientific Committee at its annual meeting this September in Australia. Contact Richard Hennemuth (FTS-840-1238 or 617-548-5123).

For more information on the above items, contact the name and number within the item, or the Center's Information & Publications Office (FTS-840-1228 or 617-548-5123x228).

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POLLOCK POPULATION IN GOOD SHAPE

The pollock population of the Northwest Atlantic is in good shape, according to a just-completed report by Center scientists. The population's total weight, or biomass, increased substantially during the mid-to-late 1970's, and has continued to be supported by the addition of large numbers of catchable-sized fish from the 1979 and 1982 spawnings.

Fishermen's catches in recent years have also been at levels which have allowed the population to replenish itself. In fact, commercial catches declined from 59 to 49 thousand tons between 1981 and 1983. The decline is apparently due to a weaker market for pollock. Contact Ralph Mayo, FTS 840-1310 or (617) 548-5123.

SERVICE ISSUES ANNUAL REPORT ON HABITAT CONSERVATION

The Service's Habitat Conservation Program has issued its first annual report (1983). The report, coming on the heels of the Service's first habitat conservation policy issued last November, is an excellent summary of the major habitat issues and Center activities in the Northwest Atlantic. Free copies are available from the Habitat Conservation Division, National Marine Fisheries Service, 3300 Whitehaven St., N.W., Washington, D.C. 20235.

NEW VIEW OF OYSTER GROWTH RATE; CYCLIC PATTERNS

The usual way to measure the growth rate of oysters is to divide any increase in the oyster's size by the amount of time it took to achieve that increase. That's an "absolute" growth rate. Another (and little used) way to measure growth rate is to first divide any increase in the oyster's size by the original size of the oyster, then to divide that percentage by the amount of time. That's a "relative" growth rate.

When we measured the relative growth rate of the juvenile oysters that were reared in our laboratory for 12 weeks under highly controlled conditions, we observed an unexpected cycle in the relative growth rate. Regardless of the types of phytoplankton the juvenile oysters were fed, or of the year or season in which experiments were conducted, the daily-fed juvenile oysters showed two peaks in the relative growth rate separated by intervals of about five weeks.

We believe this observation, that oysters are capable of cycles in relative growth rate, to be the first of its kind, and may have significance in the growth of wild as well as cultured oysters. Contact Ravenna Ukeles, FTS 642-5223 or (203) 783-4223.

FIRST WORKSHOP HELD FOR SERVICE'S PUBLIC AFFAIRS PERSONNEL

The NOAA Office of Public Affairs held the first technical workshop for the Service's public affairs personnel in Washington, D.C., during July 25-27. The 12 individuals with public affairs responsibilities and duties who attended the workshop represented the headquarters office and both the regional office and the fisheries center in the Northeast, Southeast, and Southwest.

Purpose of the workshop was to instruct the public affairs personnel on how they can: (1) help their organization's managers use public affairs to better achieve their goals and objectives; (2) handle public affairs problems and capitalize on public affairs opportunities; (3) prepare and place news material and news products with the news media; and (4) continue to develop their public affairs knowledge and skills for the benefit of their organizations. Contact Jon Gibson, FTS 840-1228 or (617) 548-5123.

SHELF LIFE OF FROZEN AMERICAN PLAICE UNDER STUDY

In the Center's ongoing study of the shelf life of frozen fish, a new effort has begun with American plaice (commercially called "dab"). Plaice fillets were cut from fish which had been held on ice for 1,5, or 9 days (to represent conditions on commercial fishing vessels), then were subjected to +10°, 0°, or -10°F storage. After one month, all fillets were acceptable in quality.

An earlier effort with Atlantic cod--using fish caught in the summer--may be supplemented with another effort using fish caught during other seasons. The summer-feeding cod were rich in fat which may have shortened their shelf life during frozen storage. Contact Joseph Mendelsohn, FTS 837-9282 or (617) 281-3600.

HORSESHOE CRABS BEING OVERFISHED?

Fisheries for horseshoe crabs for fishing bait and biomedical purposes are growing. In fact, horseshoe crabs may be overfished in some areas. To establish the biological basis for managing horseshoe crabs--should that be needed--scientists from the Center and Fordham University have begun a joint study of the species' distribution, abundance, feeding, and growth.

Historical data from the Center's bottom-trawl surveys will provide information on trends in distribution and abundance. Recent data from the surveys will provide information on feeding by this predator of clams, scallops, etc. One of the more unusual efforts will be trying to determine the age of limpets growing on the shells of horseshoe crabs as a way of indirectly determining how long the crabs themselves can live. Contact John Ropes, FTS 840-1287 or (617) 548-5123.

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AUGUST 1984

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PAPER PRESENTED ON RISKS OF TRANSPORTING SHELLFISH FOR PROPAGATION OR CULTIVATION

The Northeast Fisheries Center's "Monthly Highlights" is a selection of brief popularized accounts of Center research activities in the preceding month. These accounts focus on the practical applications of research findings to fisheries resource and habitat conservation. The name and telephone number of a Center scientist has been included at the end of each account to contact for more information.

NORTHERN SHRIMP RESOURCE CONTINUES RECOVERY IN GULF OF MAINE

Center scientists and personnel from the Maine Department of Marine Resources, New Hampshire Fish and Game Department, and Massachusetts Division of Marine Fisheries completed the 1984 northern shrimp survey of the western Gulf of Maine during July 31-August 6 aboard the Center's R/V *Gloria Michelle*. For areas sampled both in 1983 and 1984, catch rates in 1984 were generally the same or higher than in 1983. **These catch rates suggest continued recovery of this resource from the rock-bottom levels of the late 1970's.** Highest abundance occurred in the Jeffreys Ledge and Platts Bank region, although abundance appeared to be relatively high further east. Contact Steve Clark, FTS 840-1234 or (617) 548-5123.

FISH-WASTE SILAGE INCREASINGLY APPEARS TO BE PRACTICAL PLANT FERTILIZER

Fish wastes from fish processing plants have traditionally been dumped into adjoining harbors, creating organic pollution, bacterial build-ups, and oxygen depletions. As environmental management agencies have begun restricting such fish-waste dumping, how to treat or dispose of these wastes has become more difficult and expensive. In the past year, the Center and the Essex (Mass.) Agricultural and Technical Institute have cooperatively researched the simple and inexpensive conversion of fish wastes into fish silage for subsequent use as a plant fertilizer.

In our latest experiment, we planted string bean seeds in four equal-sized plots of land. Plot No. 1 was left unfertilized; plot No. 2 was fertilized with a normal amount of 10-10-10 commercial fertilizer; plot No. 3 was fertilized with silage around the base of the plants (represents hand fertiliztion) after sprouting began; and plot No. 4 was fertilized with silage over ground and plants alike (represents mechanical fertilization) after sprouting began. Results of the first picking about two months after planting are shown below:

Plot No.	Treatment	No. of plants	Average yield per plant (g)
1	Unfertilized	12	78.9
2	Fertilized with 10-10-10	21	129.7
3	Fertilized with silage around base of plants	23	136.8
4	Fertilized with silage over ground and plants	20	148.3

So far, acidified (pH 3.8) shelf-stable silage appears to be equal to or better than commercial fertilizer. The experiment and harvesting continue. Contact Burt Tinker, FTS 837-9217 or (617) 281-3600.

HIGHEST SQUID CATCHES NEAR JUNCTURE OF SHELF AND SLOPE WATER MASSES

The Center has analyzed over 1,500 foreign fisheries observers' logs to determine the catch rates and locations of short-finned squid caught off the Mid-Atlantic states during 1980-82. The Center has also analyzed satellite-produced infrared images of the sea surface to determine the locations of where the continental shelf water mass came up against the continental slope water mass ("shelf-slope front") for the same region and years. **By comparing the fisheries data with the satellite data, we found that even though only 50-60 percent of the fishing effort occurred within 10 nautical miles of the front, up to 80-100 percent of the highest catch rates occured there.**

Further analysis of these and similar data should confirm if the satellite data will be as useful a tool for directing initial fishing effort for squid as it now appears. Contact Mert Ingham, FTS 838-7142 or (401) 789-9326, or Anne Lange, FTS 840-1301 or (617) 548-5123.

BLUEFISH EGG AND LARVA SURVEY HAS BETTER DEFINED SPAWNING HABITAT; MAY BETTER ESTIMATE SPAWNING POPULATION

A common way to estimate finfish populations, the virtual population analysis, needs data on both the size of catches by commercial and recreational fishermen, and the size of samples from scientific surveys. Since the Center's basic finfish surveys use bottom trawls, excellent survey data are available for bottom-associated finfishes (e.g., haddock), but for more open-water-associated finfishes (e.g., bluefish), the data -- while still useful -- may not be as conclusive. An alternative and perhaps better way to estimate bluefish populations is to find out how many bluefish eggs are spawned each year, then figure out how many bluefish adults there had to have been to spawn that many eggs.

From mid-May through mid-August, the Center blanketed the continental shelf off the Southern New England and Mid-Atlantic states with five egg and larva surveys. These egg and larva surveys use fine-meshed plankton nets towed obliquely from the bottom to the surface. The egg and larva data will be ultimately analyzed to estimate the number of spawninig adult bluefish north of Cape Hatteras. **Already, the data show that spawning peaks from late June to July about midway out on the continental shelf from New Jersey to the offings of Chesapeake Bay.** These better defined spawning locations and times are useful in protecting critical spawning habitat from offshore waste disposal, mineral extraction, etc. Contact Wally Smith, FTS 342-8260 or (201) 872-0200.

CENTER RESPONDS TO LOBSTERMEN'S CONCERNS OVER LOW DISSOLVED OXYGEN OFF NORTHERN NEW JERSEY

New Jersey lobstermen have been sensitive to summertime depletion of dissolved oxygen off their coast since 1976 when such a depletion cost them about 1.4 million dollars by killing off or driving off lobsters in inshore waters. Overall, that 1976 oxygen depletion off New Jersey cost the

commercial and recreational fishing industries, and their related processing and servicing industries, as much as 550 million dollars, and prompted the federal government to declare the New Jersey coast a resource disaster area. The surf clam fisheries were especially hard hit.

Understandably, northern New Jersey lobstermen became concerned and sought more information from Center scientists during August when local recreational divers reported low dissolved oxygen levels at an artificial reef. Furthermore, these reports of low dissolved oxygen came on the heels of an unusually large number of phytoplankton blooms (*Olisthodiscus* and *Skeletonema*) during August -- blooms similar to those associated with the 1976 disaster.

As an early warning system against any recurrence of the dissolved oxygen depletion, the Center monitors the dissolved oxygen levels in New Jersey coastal waters every week during the warmer months. This routine monitoring, along with a special survey around the recently reported site of low dissolved oxygen, have shown the problem confined to a very small area. **With cooler water temperatures and increased water circulation likely soon, the low dissolved oxygen levels observed should remain a localized problem with no significant fisheries impact.** Contact J. O'Reilly, FTS 342-8251 or (201) 872-0200.

IDENTIFYING U.S.-SPAWNED ATLANTIC SALMON IN THE OPEN OCEAN

A problem in U.S. conservation of Atlantic salmon is determining the proportion of U.S.-spawned salmon caught in the open ocean as they mix on feeding grounds and along migratory routes with salmon spawned in other countries. To begin to solve this problem, the Center sponsored three studies last year to review methods for identifying U.S.-spawned salmon caught in the open ocean. On August 28 and 29, the Center hosted a workshop to evaluate these studies which looked at methods based on: (1) scale and "ear bone" characteristics; (2) genetic characteristics; and (3) other characteristics, including dyes and tracers, scale and ray counts, body proportions, etc. **So far, scale characteristics -- particularly circuli or "ring" patterns -- seem to be one of the more promising and practical methods.**

The workshop also dealt with future data needs and research plans for effective U.S. participation in the North Atlantic Salmon Conservation Organization. Contact Vaughn Anthony, FTS 840-1304 or (617) 548-5123.

PAPER PRESENTED ON RISKS OF TRANSPORTING SHELLFISH FOR PROPAGATION OR CULTIVATION

The introduction of exotic pests, parasites, and pathogens of shellfish into previously uncontaminated ecosystems -- as a result of intentional or accidental transport of shellfish between ecosystems -- is a time bomb waiting to explode. We got a taste of the problem a number of years ago when oysters infected with the deadly MSX disease were transported from the James River area of Chesapeake Bay to the Wellfleet Harbor area of Cape Cod Bay. The James River oysters and the native Wellfleet Harbor oysters which they in turn infected were both wiped out. Even today, oysters in Wellfleet Harbor are quarantined. Similar problems have occurred in other areas.

One of two Center scientists attending the August 5-9 annual meeting of the Society of Invertebrate Pathologists in Davis, California, presented a paper on the risks of shellfish transport, and discussed the Center's quarantine and inspection system for transported shellfish. Copies of the abstracted paper are available from Aaron Rosenfield, (301) 226-5193.

GIBSON

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts 02543

SEPTEMBER 1984

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The Northeast Fisheries Center's "Monthly Highlights" is a selection of brief popularized accounts of Center research activities in the preceding month. These accounts focus on the practical applications of research findings to fisheries resource and habitat conservation. The name and telephone number of a Center scientist has been included at the end of each account to contact for more information.

STATUS-OF-THE-STOCKS ANNUAL REPORT ISSUED

During mid-September, the Center issued its annual report on the status of the stocks in the Northeast Region. The report, entitled "Status of the Fishery Resources Off the Northeastern United States for 1983" (*NOAA Technical Memorandum NMFS-F/NEC-29*), contains information on stocks of 34 commercially and recreationally important species.

Like the 1981 and 1982 annual reports, this 1983 annual report includes sections on the trends in the region's commercial and recreational fisheries. **This year's report, though, includes two new sections: a summary of the status of each species/stock, and an overview of the economics of several major fisheries.** Only a handful of copies remain from the fist printing of 600. A second printing may occur. Contact Emory Anderson, FTS 840-1251 or (617) 548-5123.

CAPTURING AND USING WASTE HEAT FROM SEAFOOD REFRIGERATION SYSTEMS

The Center's Gloucester Laboratory is constructing a heat pump to capture the waste heat in the cooling water of the Laboratory's seafood refrigeration system. Currently, this waste heat is discharged into the atmosphere through a cooling tower. Ultimately, the captured waste heat will supplement the Laboratory's traditional heating plant.

By using an automatic on-off switch for the heat pump, the energy cost for running the pump will be about the same as the energy cost for running the cooling tower. But, because the pump gains heat and the tower loses heat, the pump is more energy efficient. **This energy-saving approach should serve as a model for commercial seafood processing and retailing facilities.** Contact Bob VanTwuyver, FTS 837-9319 or (617) 281-3600.

BLUEFISH RECRUITMENT LINKED TO FIRST-YEAR DIET?

Field studies of feeding and growth by juvenile (age 0) bluefish during summer 1981 and summer 1983 suggest that first-year growth varies with diet. The 1981 age 0 blues mostly fed on other fish; the 1983 age 0 blues fed on a mixture of fish and invertebrates. As one would expect, the fish-fed 1981 blues were larger and healthier. In light of the long migration age 0 blues undertake in the fall, their size and condition after their first summer's feeding may affect their first-year survival, which in turn may affect their recruitment to the adult stock. In fact, the 1983 status-of-the-stocks report described earlier in this issue showed recruitment from the 1981 year class higher than that from the 1983 year class.

Our first observation on our just-completed 1984 summer sampling shows this year's class of age 0 blues to be feeding on a very large number of very small invertebrates (copepods). **If the trend holds, the 1984 year class of bluefish may not be as strong as the 1981 and 1983 year classes.** Contact Anne Studholme, FTS 342-8280 or (201) 872-0200.

FDA TO CONSIDER DRUGS FOR TREATING DISEASE OUTBREAKS IN SHELLFISH HATCHERIES

Disease is a major limiting factor in the success of commercial shellfish hatcheries. Although the Food and Drug Administration (FDA) has not yet approved any drugs for treating disease outbreaks at such hatcheries, it has started the process by which it approves such drugs by holding two workshops in Gaithersburg, Maryland, during August 20-22: "Drug Disposition and

Metabolism in Aquatic Species" and "Minor Use of New Animal Drugs." **At the invitation of the FDA, a Center scientist represented the National Marine Fisheries Service and the shellfish aquaculture industry at these workshops, and is now preparing an outline of culture methods and a list of prophylactic drugs for FDA consideration.** Contact Carolyn Brown, FTS 642-5239 or (203) 783-4239.

MARMAP EGG SURVEYS YIELD SPAWNING STOCK BIOMASS ESTIMATES

The Center's MARMAP surveys of fish egg and larval distribution and abundance provide information on first-year mortality which in turn provides information on year-class success. In addition, the egg abundance data can be used to back-calculate the biomass of spawning stocks. **Based on these MARMAP surveys, the Center has just issued a report on spawning stock biomass estimates for five species for the region from Cape Hatteras to the Gulf of Maine.** The report, "Recent Estimates of Adult Spawning Stock Biomass Off the Northeastern United States from MARMAP Ichthyoplankton Surveys" (*NOAA Technical Memorandum NMFS-F/NEC-30*), documents spawning stock estimates for one or more years since 1977 for Atlantic mackerel, yellowtail flounder, silver hake, haddock, and sand lance.

These fishery-independent estimates are useful for species or stocks for which there is no fishery, for instance, the sand lance which is currently at high abundance and is a significant item in the diet of many marine fish, mammals, and birds. The estimates are also useful as supplementary data for fisheries in which catch data are inadequate for traditional stock assessment methods such as virtual population analysis (VPA), for instance the bluefish (see August issue of "Monthly Highlights"). Another example is the silver hake fishery. Since the drastic reduction of distant-water fleets since 1977, the offshore catch of silver hake has rapidly declined, resulting in less reliable VPA population estimates. The first estimate of silver hake spawning stocks based on MARMAP surveys was made in 1979 and compared favorably with the available VPA estimate. The egg estimate can also determine the distribution of spawning activity for migratory stocks which range over wide areas, for instance, the Northwest Atlantic mackerel stock which ranges from Newfoundland to Cape Hatteras. The MARMAP spawning biomass estimates of this stock strengthen our estimates of the proportion of the stock which spawns in U.S. waters.

Determining the accuracy of these spawning stock estimates based on egg surveys will require a time series of comparisons with reliable VPA estimates; one of the important results of the MARMAP program. Contact Peter Berrien, FTS 342-8266 or (201) 872-0200, or Mike Pennington, FTS 840-1285 or (617) 548-5123.

CENTER SCIENTISTS TRAIN AND ADVISE SOUTH CAROLINA AND GEORGIA SHELLFISH AQUACULTURISTS

The Center is helping the State of South Carolina's recently completed James M. Waddell, Jr., Mariculture Center to provide technical assistance to that state's shellfish aquaculture industry. Our scientists offered 10-day, hands-on training at the Milford Laboratory for Waddell's hatchery manager and algal culturist, then later offered on-site advice on managing Waddell's seawater system and on raising offspring of genetic-specific stocks.

The Center is also helping the University of Georgia's Skidway Campus to choose productive avenues in shellfish research. Our scientists provided

comments and/or suggestions on shellfish research facilities, oyster spat collection and substrate use, bay scallop research (using all three subspecies), and genetic breeding and rearing of hard clams.

This transfer of scientific and technical knowledge from the Center to state institutions is one of the important products/byproducts of the Center's shellfish research. As these and other state and private institutions progress, though, not only will there continue to be this one-way transfer of knowledge, but through cooperative research efforts, the transfer will undoubtedly become a two-way affair. Contact Ed Rhodes, FTS 642-5200 or (203) 783-4200.

SPECIES IDENTIFICATION SHEETS AVAILABLE FOR WEST INDIAN OCEAN FISHERIES

The United Nations Food and Agriculture Organization (FAO) has published a set of species identification sheets for fishing purposes in FAO Fishing Area 51, the western Indian Ocean. This set, consisting of five looseleaf volumes and an index, covers bony fishes, cartilaginous fishes, lobsters, shrimps, and turtles. Each species account includes scientific names, common names, distinctive characters, size, distribution, fishing grounds, and catch. There are figues of the entire animal, its diagnostic characters, and similar species, as well as a map of its distribution in the fishing area.

The National Systematics Laboratory contributed accounts for nine families (Belonidae, Bregmacerotidae, Coryphaenidae, Echeneidae, Hemiramphidae, Moridae, Pomatomidae, Rachycentridae, and Scombridae). **This set of sheets, along with earlier sets on the west Central Atlantic and east Central Atlantic, are available from: Walter Fischer, Fisheries Dept., FAO, Vic delle Terme di Caracalla, 00100 Rome, Italy.** Contact Bruce Collette, (202) 357-2524.

SOFTSHELL CLAM POPULATIONS OF CHESAPEAKE BAY LIMITED BY CANCEROUS TUMORS

Animals, just as humans, can develop diseases when exposed to disease-causing conditions and/or disease-causing agents. It's not surprising, therefore, that a number of animals, just as humans, develop cancerous tumors when exposed to cancer-associated environmental conditions and/or viral agents. One of the animals which has been so affected is the softshell clam of Chesapeake Bay. Cancerous animals--clams or anything else--can't transmit their cancer to humans, so there is no concern for the effects on man. But, cancerous animals can suffer high mortality, so there is concern for the effects on clam populations.

Both Center and non-Center scientists have just coauthored a manuscript for publication on this outbreak of cancerous tumors in softshell clams of Chesapeake Bay. **The manuscript covers how the disease: (1) may have been introduced into Chesapeake Bay; (2) has established itself at high prevalences (50 percent) over a wide area of the Bay within five years; and (3) progressively advances and ultimately kills clams.** Contact Austin Farley, (301) 226-5193.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
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Woods Hole, Massachusetts 02543

OCTOBER 1984

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SEA SCALLOPS MORE ABUNDANT IN SOME AREAS

The Center's 1984 survey of sea scallop populations in the Gulf of Maine, Georges Bank, and Mid-Atlantic areas shows that scallops in some areas are more abundant to fishermen this year than last. The 1983 survey showed record low abundance.

In the Mid-Atlantic, abundance increased in the New York Bight (New Jersey to Long Island), remained the same off Delmarva, and decreased off Virginia-North Carolina. On Georges Bank, abundance markedly increased along the northern edge and on the northeast peak (now Canadian waters) due to exceptionally large recruitment from the 1981 year class, remained the same in the southeast part, and continued to decrease in the Great South Channel. In the Gulf of Maine, high survey catch rates occurred on Fippennies Ledge.

Contact Fred Serchuk, FTS 840-1245, or (617) 548-5123.

FISH POPULATION SHIFTS CONTINUE IN NORTH SEA

The North Sea and the U.S. northeast.continental shelf are somewhat similar ecosystems. Consequently, similar changes in environmental conditions, fishing pressure, or management regimes can (but don't necessarily) cause similar changes in fish stocks. For example, when herring and mackerel stocks both in the North Sea and on Georges Bank greatly decreased in the mid-1970's, sand lance stocks in both ecosystems greatly increased due likely to the scarcity of herring and mackerel to prey upon them.

At the 1984 Statutory Meeting of the International Council for the Exploration of the Sea held earlier this month in Copenhagen, Denmark, a Dutch scientist reported that since 1977-78, North Sea herring have again increased, sand lance (and Norway pout) have remained at the same level, and mackerel (and sprat) have greatly decreased. **However, because the North Sea herring are still scarce compared to the 1940's and 1950's, it's still premature to speculate on whether Georges Bank will again mimic the North Sea, with herring increasing, sand lance remaining the same, and mackerel decreasing.** Center scientists and their western European counterparts continue to study the underlying causes and effects of these massive shifts in fish stock abundance on both sides of the Atlantic.

Contact Ken Sherman, FTS 838-7142 or (401) 789-9326.

HIGH LEVELS OF ORGANIC CONTAMINANTS IN MASSACHUSETTS BAY SEDIMENTS

Battelle Laboratory, under contract to NOAA's Northeast Monitoring Program, has completed a comprehensive survey of toxic organics in sediments and selected organisms of Boston Harbor, Massachusetts Bay, and Cape Cod Bay. Results of the survey, which generally show high levels of toxic organics in sediments but low levels in organisms, will soon be published as *NOAA Technical Memorandum NMFS-F/NEC-32*.

Massachusetts Bay sediments landward of Stellwagen Bank contain levels of polychlorinated biphenyls (PCB's) and polycyclic aromatic hydrocarbons (PAH's) 2-3 times higher than New York Bight sediments. (These levels are partly a reflection of most of Massachusetts Bay being deeper than the New York Bight and retaining more fine sediments which attract contaminants; not necessarily a reflection of the amount of contaminants being received by the two areas.) **Limited comparisons with earlier data indicate levels may be increasing in Massachusetts Bay.**

Cape Cod Bay and offshore Gulf of Maine sediments also contain high levels of PCB's and PAH's, although not as high as Massachusetts Bay sediments. Winter flounder and American plaice in Cape Cod Bay have low levels of these contaminants. Jonah crabs have higher levels, but maximum values are still only about a tenth of the Food and Drug Administration's two-parts-per-million action level for PCB's in finfish and shellfish. The potential exists for further uptake from the reservoir of contaminated sediments, however.

The survey also confirmed the heavy pollution of Boston Harbor sediments, and identified sewage discharges and storm water runoff as dominant sources.

Contact Bob Reid, FTS 342-8220 or (201) 872-0200.

OYSTER BAR MUD CRAB SPECIES COMPLEX RESOLVED

Panopeus crabs are significant predators on oysters, but there has been a long-standing problem on the taxonomic status of *P. herbstii*, the oyster bar mud crab. Three related papers in the most recent issue of the *Fishery Bulletin* (Volume 81, Issue 4)--authored by a National Systematics Laboratory scientist and associates--solve this problem. **A reevaluation of the oyster bar mud crab complex, based on morphology, blood protein electrophoresis, and ecology, shows six closely related species: one on the eastern U.S. coast, one on the northern Gulf Coast, one associated with the marsh grass *Spartina* on both the eastern U.S. coast and northern Gulf Coast, one in the Caribbean and western South Atlantic, and two analogs of North American species in South America below Cape Frio.**

Contact Austin Williams, (202) 357-2639.

COMPUTER-ASSISTED SYSTEM DEVELOPED TO IDENTIFY MARINE BACTERIA

The ability to identify specific disease-causing (pathogenic) bacteria is important in controlling diseases of cultured marine animals. Specific identifications are needed to predict disease effects, to plan therapeutic measures, and to trace disease sources.

Speedy and reliable systems (which combine: (1) commercially available instruments that analyze numerous biochemical charactertistics of unknown pathogens, with (2) computer programs that numerically match the biochemical characteristics of unknown pathogens with the biochemical profiles of known pathogens) have been developed for identifying specific human pathogens. However, these systems do not cover most marine bacteria.

Consequently, to aid our identification of marine bacterial pathogens, we developed a computer program which rapidly compares the biochemical characteristics of unknown marine bacteria with the biochemical profiles of all previously characterized marine pathogens. We are now statistically analyzing the program's reliability when varying numbers of biochemical characteristics are used. **With this statistical analysis as a guide, we should be able to increase measurably the speed and reliability of our bacterial identifications.**

Contact Dick Robohm, FTS-642-5237 or (203) 783-4237.

CONSERVATION MEASURES ADOPTED FOR ANTARCTIC FISH STOCKS

The Center continues to assist U.S. participation in the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), particularly through the Center's involvement in the CCAMLR's Scientific Committee. **At its third annual meeting in Hobart, Australia, last month, the CCAMLR--based on the Scientific Committee's advice--adopted its first conservation measures by enacting closed-fishing-area and minimum-mesh-size regulations, and by requesting no directed fishery and minimum bycatch for one species in particular.** Before the next annual meeting, a Center scientist will convene the Scientific Committee's Ad Hoc Working Group on Fish Stock Assessment in Hobart to determine age/length compositions and recruitment trends of major stocks, and to advise the Scientific Committee of any subsequently needed conservation measures.

Contact Dick Hennemuth, FTS 840-1238 or (617) 548-5123.

COMMERCE DEPARTMENT AWARDS SILVER MEDAL TO CENTER SCIENTIST

The U.S. Department of Commerce has awarded a silver medal to the Center's Dr. Vaughn C. Anthony. The silver medal, the second highest award given by the Department, is granted by the Secretary of Commerce for "meritorius contributions of unusual value to the Department."

The award recognizes Dr. Anthony's stock assessment research accomplishments, his leadership in national and international assessment-oriented committees and working groups, and his innovations in communicating research findings to Center constituents in the form of semitechnical reports and popular articles. Dr. Anthony's contributions have significantly improved the management of fishery resources worth millions of dollars to the national economy.

Contact Mike Sissenwine, FTS 840-1239 or (617) 548-5123.

GIBSON

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
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NOVEMBER 1984

IN THIS ISSUE:

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FIRST ASSESSMENT OF GEORGES BANK SURF CLAMS YIELDS INITIAL ESTIMATE FOR CATCH QUOTA

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OILY FISH SUCH AS SALMON AND MACKEREL REDUCE HEART DISEASE

Heart disease annually kills a half-million Americans. Earlier this year, the National Institutes of Health (NIH) scientifically linked for the first time the death rate from heart disease with the cholesterol levels in our blood. **At the same time evidence began to appear and grow that oily fish such as salmon and mackerel--once thought to raise cholesterol levels--now seem to decrease low-density lipoproteins (LDL) which package and deliver cholesterol throughout the circulatory system, and to increase high-density lipoproteins (HDL) which remove cholesterol from the system. The NIH study showed that lowering the level of LDL and raising the level of HDL substanially reduced the chance of heart attack.** Moreover, a diet high in fish oil can reduce the chance of stroke-causing blood clots by changing the blood's viscosity.

However, we don't know the specific ingredient in fish oil which lowers LDL and raises HDL, nor do we know how that ingredient operates. Accordingly, in the next few years, NIH will obtain refined and standardized fish oils from NMFS laboratories to identify the specific ingredient, define how it operates, and measure its health effects. In preparation for possible involvement in this joint NIH-NMFS study, Center scientists have met with their counterparts in the Southeast and Northwest & Alaska Fisheries Centers, and have met with MIT Sea Grant scientists who have an ongoing study into fish oils.

Contact Judy Kryznowek, FTS 837-9226 or (617) 281-3600.

YELLOWTAIL FLOUNDER FISHERY HEADED FOR DEEPER TROUBLE

Preliminary field data through September show that commercial landings of yellowtail flounder for the first three quarters of 1984 have decreased 45 percent from the corresponding period of 1983. Since the yellowtail fishery has major importance for the Northeast's commercial fishing industry, these decreased landings will significantly affect that industry. The 1983 yellowtail landings of 73 million pounds (worth 35 million dollars in "ex-vessel" or dockside prices to fishermen) were double the landings of any other flounder, and were second only to Atlantic cod in landings by the Northeast's bottom-trawl fisheries.

Data from the Center's perennial series of autumn bottom-trawl surveys of fish populations on the Northeast's continental shelf show declining indexes for yellowtail flounder on all fishing grounds since 1982. **The just completed 1984 survey yielded indexes among the lowest on record.**

Our current assessment indicates that fishing mortality of yellowtail flounder is at or near record high levels, and that the fishable population largely depends upon the recruitment of new year classes. The strong 1980 year class, which largely supported the 1982 and 1983 fisheries, has been greatly reduced by fishing; more recent year classes have been much weaker. **This autumn's survey catches of age 1 yellowtail (i.e., the 1983 year class) were extremely low, indicating that recruitment to the 1985 fishery will be poor.**

Contact Steve Clark, FTS 840-1312 or (617) 548-5123.

PRESERVATIVE EXTENDS SHELF LIFE OF FRESH POLLOCK FILLETS

We can increase our seafood supply not only by larger harvest from fish populations, but also by better use of the harvests themselves. Improved utilization is a conservation measure gaining importance as our harvests of several popular species are now near or beyond the long-term sustainable level (e.g., Atlantic cod, yellowtail flounder, etc.).

One way to improve utilization is to extend the shelf life of fresh and frozen fishery products. Accordingly, we are experimenting with potassium sorbate for, among other things, extending the shelf life of fresh fish fillets. (Potassium sorbate is an FDA-approved and widely used food preservative.) After earlier experimenting with cod and yellowtail, we are now experimenting with pollock since it will likely become more important in the Northeast's fisheries when the large spawn of 1982 grows to a catchable size in 1986. **The pollock results look excellent: 2-3-day-old fillets dipped in five-percent potassium sorbate had an overage shelf life of 20 days; undipped fillets had an average shelf life of 10 days. Although potassium sorbate treatment is expensive, the effective doubling of fresh shelf life more than compensates.**

Contact Burt Tinker, FTS 837-9217 or (617) 281-3600.

MODEST INCREASE IN SCROD HADDOCK ON GEORGES BANK NEXT YEAR

The Center's just completed autumn bottom-trawl survey indicates a modest increase for 1985, compared to both 1983 and 1984, in the number of age 2 or small "scrod" haddock recruiting to the Georges Bank fishery. Although this autumn's average catch of age 1 haddock (i.e., the 1983 year class which recruits to the fishery next year at age 2) per survey tow on Georges Bank was higher than the past two autumns' surveys, the level was still much lower than the levels of the late 1970's prior to recruitment of the strong 1975 and 1978 year classes. Thus, we do not expect recruitment of the 1983 year class of haddock to significantly increase the stock size on Georges Bank.

This autumn's average catch of age 1 haddock per survey tow in the Gulf of Maine was also low.

Contact Bill Overholtz or Steve Clark, FTS 840-1256/1282 or (617) 548-5123.

AMERICAN FINFISH & SHELLFISH SCIENTISTS GAIN FROM JAPANESE AQUACULTURAL EXPERIENCE

A Center scientist along with others representing NMFS, the U.S. Fish and Wildlife Service, and Sea Grant, attended the 13th annual meeting of the Aquaculture Panel of the United States-Japan Program in Natural Resources (UJNR), held last month in Ise, Japan. (The UJNR provides a fast-track information exchange between American and Japanese scientists in many natural resource fields.) A major benefit to American scientists at this meeting was experience with the large scale of Japanese finfish and shellfish aquaculture, as well as of Japanese research into such areas. In view of the ever-increasing demands upon NMFS to restore anadromous fish (e.g., Atlantic salmon, striped bass, etc.) and boost shellfish production (e.g., surf clams, American oysters, etc.), the meeting provided much useful information.

Contact Ed Rhodes, FTS 642-5226 or (203) 783-4226.

FIRST ASSESSMENT OF GEORGES BANK SURF CLAMS YIELDS INITIAL ESTIMATE FOR CATCH QUOTA

Through November, the Georges Bank surf clam fishery, which began last spring, has produced 401 thousand bushels of clams, or 6.8 million pounds of meats. To assist the Mid-Atlantic and New England Fishery Management Councils in managing this resource, the Center has produced its first assessment of it.

Our assessment shows that the Georges Bank surf clam population is only about 10 percent as large as the Mid-Atlantic population, but that significant concentrations do occur around Cultivator Shoals, Georges Shoals, etc. All significant concentrations occur on the American side of the new American-Canadian boundary on Georges Bank. Clams in shallow water (i.e., less than 30 fathoms) show good growth--similar to that in the Mid-Atlantic.

The Councils asked the Center for an initial estimate for a catch quota, based upon keeping the catch rate (i.e., the proportion of the population caught in one year) the same on Georges Bank as it is in the Mid-Atlantic. **On this basis, the assessment yields an initial estimate of 250-300 thousand bushels of clams, or 4.3-5.1 million pounds of meats, per year. These harvest levels should keep the new fishery going for several years and renew interest in surf clam processing in New England.**

Contact Steve Murawski, FTS 840-1303 or (617) 548-5123.

NORTHEAST FISHERIES CENTER

ONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts 02543

DECEMBER 1984

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The Northeast Fisheries Center's "Monthly Highlights" is a selection of brief popularized accounts of Center research activities in the preceding month. These accounts focus on the practical applications of research findings to fisheries resource and habitat conservation. The name and telephone number of a Center scientist has been included at the end of each account to contact for more information.

NEW REPORT SERIES FOR FISHERMEN ON CENTER'S RESEARCH VESSEL SURVEY FINDINGS

The Center has started a *Fishermen's Report* to provide fishermen and others with timely information from the Center's research vessel surveys on finfish and invertebrate distribution and abundance. Each report is issued within 2-3 weeks of the end of a survey, and plots the sampling locations, lists details for each location (i.e., date & time, latitude & longitude, loran bearings, course & depth, and bottom temperature), and plots and lists size of catches for major species at each location. Most commercially and recreationally important species between the Gulf of Maine and Cape Hatteras are covered. The *Fishermen's Report* for the 1984 bottom trawl survey is available from Tom Azarovitz, FTS 840-1283 or (617) 548-5123.

PLANS FOR PROVIDING REAL-TIME TEMPERATURE INFORMATION TO FISHERMEN

The Atlantic Environmental Group (AEG) plans to provide sea-surface temperture information to fishermen 50-67 precent faster than in the past.

For many years, the AEG has provided the Northeast's fishermen with modified versions of NOAA's oceanographic analysis charts--satellite-derived charts of offshore sea-surface temperatures. Offshore fishermen use the charts' information on rapid temperature changes associated with ocean fronts and warm-core Gulf Stream rings to save time and fuel in locating swordfish, tunas, sharks, and marlin. (The New Jersey Sea Grant Extension Service and the American Swordfish Association estimate an annual savings of 2.25 million dollars in fuel costs.) Also, deep-sea red crab fishermen use the charts' information to avoid gear losses by keeping their pots away from the strong currents of warm-core rings.

Based on the success of the modified oceanographic analysis charts, for the past 1½ years the AEG and the University of Rhode Island have provided about 175 Southern New England fishermen with 34 enhanced charts of inshore sea-surface temperatures within 48-72 hours of the data being gathered by NOAA satellite. Now, AEG plans to increase the coverage of the charts up and down the coast, and decrease the turnaround time to 24 hours. These improvements--requested by the commercial and recreational fishing industry--hinge on a continuing increase in the directness of communication between the satellite and AEG's Narragansett, Rhode Island, location. Contact Reed Armstrong, FTS 838-7142 or (401) 789-9326.

SOVIETS SUGGEST WORLD CATCH COULD DOUBLE IN 20-30 YEARS

A Soviet scientist, P. Moiseev, suggests that the world catch could increase from the current 70 million metric tons (mmt) to 150 mmt in the next 20-30 years. Moiseev made the suggestion in a book just recently translated by the NMFS Office of International Fisheries. The book, *Oceanology: Biology of the Ocean. Volume 2: Biological Productivity of the Ocean*, is edited by M.E. Vinogradov, Deputy Director of the Shirshov Institute of Oceanology of the U.S.S.R. Academy of Sciences. It comprehensively reviews Soviet studies in marine productivity at all trophic levels. Among the stocks indentified for potential increases are: anchovies off Mexico and Argentina; sardines off Africa and Australia; mackerels in the Southwest Pacific and off West Africa; sauries and sand eels in the North Pacific and North Atlantic; small tunas and sharks in the open waters of the Atlantic, Indian, and Pacific; and krill in the Antartic.

The English translation is now in press as *NOAA Technical Memorandum NMFS-F/NEC-34* and should be available in late February. Contact Ken Sherman, FTS 838-7142 or (401) 789-9326.

MACKEREL STOCK CONTINUES INCREASE

The Center's latest assessment indicates a continuing increase in abundance and biomass of the Northwest Atlantic mackerel stock. Total stock biomass at the beginning of 1985 is estimated at nearly 1,200,000 metric tons (mt), more than double the 1980 level of about 475,000 mt. This increase is due to improved recruitment. The 1982 and 1984 year classes appear particularly strong.

Commercial and recreational catches off the U.S. and Canadian coasts have remained relatively stable during 1978-84 at an average of nearly 33,000 mt; the 1984 catch was 38,500 mt. Catches off the U.S. coast alone increased sharply in 1984 (due primarily to joint ventures) and are likely to increase further in 1985 as a result of such activity. The 1985 catch would be about 68,000 mt if fishing pressure remained the same as in 1984. Contact Emory Anderson, FTS 840-1251 or (617) 548-5123.

SQUID STOCKS DOWN

The Center's 1984 research vessel surveys indicate that the numbers of long-finned and short-finned squid recruiting to the 1985 fishery will be down. For long-finned squid, the 1984 year class appears to be half the size of the 1968-81 average, and if fishing pressure in 1985 is similar to that during 1978-81, then the 1985 harvest should be about 17-18 thousand metric tons. For short-finned squid, the 1984 year class appears to be the lowest since 1973, but the biomass of the population should be adequate to maintain the harvest at recent levels. Contact Anne Lange, FTS 840-1301 or (617) 548-5123.

SAND LANCE REPRODUCTION STILL HIGH, GEORGES BANK HERRING STILL NIL

The 1984 reproduction of sand lance continued robust with the larval population centered around Nantucket Shoals off Southern New England. Sand lance are a double-edged sword for the Northeast's fisheries; they are important prey for commercially and recreationally important fishes such as silver hake and Atlantic mackerel, but are also important competitors with young mackerel and Atlantic herring for their plankton prey. The once-productive spawning beds of Atlantic herring on Georges Bank remained largely barren in 1984. No evidence of significant herring spawning has been observed there now since 1979.

These reproduction estimates come from the Center's eighth year of egg and larval surveys from Nova Scotia to North Carolina. The 1984 surveys emphasized bluefish reproduction; results are not yet available, though. Bluefish will again be emphasized in the 1985 surveys, with the Southeast Fisheries Center covering the southern limits of the East Coast spawning range. Contact Wally Smith, FTS 342-8260 or (201) 872-0200.

CONTAMINATED SEDIMENTS RAISE RISKS TO BLOODWORM SURVIVAL

Center lab studies show that oil-contaminated sediments--at levels found in chronically polluted habitats--may not kill bloodworms (*Glycera dibranchiata*), but may alter their behavior enough to increase the risks of death from other causes. (Bloodworms are a popular fishing bait and support a major bait fishery in Maine.) Worms burrowing into oiled sediment soon emerge, exposing themselves to predation. Worms exposed to oiled sediment and then buried in clean sediment, burrow abnormally. The feeding rate is also reduced after exposure to the highest test levels. Contact Anne Studholme, FTS 342-8277 or (201) 872-0200.

COPPER HARMS SEA SCALLOP REPRODUCTION

Recent experiments by Center scientists show that copper can prevent the normal development of sea scallop gonads. When held for eight weeks in seawater with 10-20 parts per billion of copper, or with 10 parts per billion of copper and 18 parts per billion of cadmium, sea scallops showed reduced levels of gonad maturation. These levels of copper are similar to those found on some inshore scallop grounds of New England. If, and to what extent, copper has affected reproduction in natural scallop populations is not known.

However, the techniques used by Center scientists to link copper toxicity with reduced maturation in the lab, could be applied to natural populations. A combination of biological and biochemical techniques, including RNA, DNA, and protein analyses, reflects the level of gonad maturation and could be used to demonstrate the effect of copper on reproduction in the field. Contact Larry Buckley, FTS 838-7142 or (401) 789-9326.

LEADING BOOK PUBLISHED ON SYSTEMATICS & DEVELOPMENT OF BONY FISHES

The American Society of Ichthyologists and Herpetologists, with the assistance of the National Marine Fisheries Service, has published the Ahlstrom Symposium on the Ontogeny and Systematics of Fishes. The book summarizes the systematic status and developmental patterns of most groups of bony fishes, and contains major contributions by Center scientists on the Scombroidei (tunas, mackerels, billfishes, etc.), Gadiformes (cods, hakes, cusks, etc.), Beloniformes (halfbeaks, needlefishes, flyfishes, etc.), and Cyclopteridae (snailfishes, lumpsuckers, etc.). These contributions show relationships within each group, summarize scientific literature on eggs and larvae, and illustrate representative larvae. The book is available from Dr. Linda Trueb, Museum of Natural History, University of Kansas, Lawrence, Kansas 66044. Contact Bruce Collette (Beloniformes and Scombroidei), FTS/(202) 357-2524, or Mike Fahay (Gadiformes and Cyclopteridae), FTS 342-8261 or (201) 872-0200.

CENTER DEVELOPING INFORMATION FOR GENETICALLY BREEDING IMPROVED SHELLFISH POPULATIONS

After reviewing the prospects for using the new technology of gene transfer to improve (faster growth, more disease resistance, etc.) economically important plant and animal breeds, leading scientists are now calling for more research on the structure and control of genes in those breeds. These scientists are also cautioning, though, that this new genetic research should be in conjunction with, not at the expense of, the traditional breeding programs. Aquacultured finfish and shellfish should be included in this new research. Center scientists are now beginning work which will ultimately help in the practical transfer of cloned genes conferring economically important characteristics to shellfish species. Contact Arlene Longwell, FTS 642-5207 or (203) 783-4207.

NORTHEAST FISHERIES CENTER

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SCROD COD MORE ABUNDANT ON GEORGES BANK IN 1985

Scrod cod will be more abundant on Georges Bank during 1985 than at any time since 1982, according to the Center's 1984 autumn bottom trawl survey. Survey catches of age 1 cod (i.e., the 1983 year class which will recruit to the Georges Bank fishery as "scrod" during 1985) were the highest since autumn 1981, and the fifth highest since the mid-1960's. This potential for above-average recruitment from the 1983 year class was first recognized in autumn 1983 when catches of young-of-the-year cod were among the highest observed in the history of the survey series. Contact Fred Serchuk, FTS 840-1245 or (617) 548-5123.

MID-ATLANTIC SURF CLAM LANDINGS INCREASE, BUT RESOURCE REMAINS ABUNDANT

Surf clam landings in the Fishery Conservation Zone increased to about 52 million pounds of meats during 1984, up 15 percent from 1983. Including landings from inshore areas, the 1984 total was about 62 million pounds, the highest since 1975.

The Center's surf clam surveys indicate continued abundance of Mid-Atlantic clams due primarily to the very strong 1976 and 1977 year classes off New Jersey, Maryland, and Virginia. The 1983 year class off central New Jersey appears to be the strongest since 1977, but a thorough evaluation of the strength of that year class must await future surveys. Regardless, known resources appear adequate to support current harvest levels until the early 1990's. Contact Steve Murawski, FTS 840-1303 or (617) 548-5123.

SCALLOP LANDINGS CONTINUE DECLINE; FISHING ACTIVITY SHIFTS SOUTH

Preliminary data for 1984 indicate a decline in American and Canadian sea scallop landings from Georges Bank, the Mid-Atlantic, and the Gulf of Maine to 9,900 metric tons of meats, the lowest harvest in 10 years. Landings from Georges Bank (4,800 tons) were the lowest since 1948, with the American landings (2,850 tons) the lowest since 1975. American landings from the Mid-Atlantic (4,000 tons) increased 24 percent from 1983; American landings from the Gulf of Maine (800 tons) decreasd by 11 percent. The Mid-Atlantic increase reflects a shift by some vessels from fishing Georges Bank/Gulf of Maine to fishing the Mid-Atlantic; and an increase by many vessels in their number of trips and number of days per trip when fishing the Mid-Atlantic.

The Center's sea scallop surveys in recent years indicate declines in abundance in almost all areas fished by the American fleet. The 1984 survey indicates that with the exception of the northern edge and northeast peak regions of Georges Bank (now mostly in Canadian waters) and the New York Bight region (off Long Island and New Jersey), abundance is now at historically low levels. Fishing mortality is now near historically high levels, and the fishery strongly depends upon recruitment of new year classes.

Because of the relative scarcity of scallops in American waters on Georges Bank and the current exclusion of American fishermen from Canadian waters on the Bank, the American fleet will likely continue to concentrate its activity in the Mid-Atlantic during 1985. Contact Fred Serchuk, FTS 840-1245 or (617) 548-5123.

REPORT AVAILABLE ON NEW BEDFORD SEA SCALLOP FISHERY

The Center has prepared a brief report on the New Bedford, Massachusetts, sea scallop fishery. The report shows the port accounting for more than half of the American scallop landings and revenues. New Bedford's 1983 landings generated 58 million dollars in ex-vessel prices, about 2.5 percent of the total of all American fisheries. For copies of the report, contact Fred Serchuk, FTS 840-1245 or (617) 548-51234.

EXPERIMENTAL HEAT PUMP CUTS COSTS FOR SEAFOOD PROCESSORS

Energy use can be a major cost in operating seafood processing plants, especially for those plants that heat large open work areas and that have large refrigeration systems. The Center has developed and tested an experimental heat pump to make use of heat that might otherwise be lost or be discharged from such plants. This experimental energy conservation system appears to significantly cut energy costs. Contact Bob Van Twuyver, FTS 837-9319 or (617) 281-3600.

CENTER ASSISTS IN CONTAMINATED WATER DIVE

In mid-December, the Environmental Protection Agency (EPA) sought the assistance of the Center in searching an abandoned coal strip mine pond near McAdoo, Pennsylvania, for suspected drums containing hazardous wastes. The Center provided one diver-scientist with experience in diving in contaminated environments. The EPA, U.S. Coast Guard, and NOAA Diving Office also supplied a diver apiece with similar experience. No drums were found in the highly acidified (i.e., pH of 3.5) pond.

NOAA is the lead federal agency for developing equipment, methods, knowledge, etc., for diving in contaminated environments. Consistent with and supportive of NOAA's role, the Center has several diver-scientists with various levels of experience in diving in polluted fisheries habitats, and can provide advice -- and sometimes assistance depending upon the circumstances -- for diving in such habitats. Contact Cliff Newell, FTS 840-1215 or (617) 548-5123.

DECAPOD CRUSTACEAN BOOK RECEIVES RAVE REVIEWS

Shrimps, Lobsters, and Crabs of the Atlantic Coast of the Eastern United States, Maine to Florida, authored by the National Systematics Laboratory's Austin Williams and published by the Smithsonian Institution Press in 1984, has received rave reviews. Lawrence G. Abele, writing in the *American Zoologist*, says "What a treasure -- keys, illustrations, notes on morphology and ecology, and other information for 342 species of decapod crustaceans known from eastern North American.... The volume is a steal at $40.00. Anyone working in any aspect of decapods must have this volume at hand." Contact Bruce Collette, FTS/(202) 357-2524.

NORTHEAST FISHERIES CENTER

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PCB LEVELS MAY BE DECREASING IN LONG ISLAND SOUND

The Center's analyses of livers from windowpane flounders netted near Charles Island in Long Island Sound in October 1984 showed a marked decrease in polychlorinated biphenyl (PCB) levels when compared with windowpane netted there during 1980-82. The 1980-82 livers had mean PCB levels of 0.6-2.3 ppm; the 1982 livers alone had a mean level of 0.9 ppm. The October 1984 livers had a mean level of 0.5 ppm. This difference is statistically significant and suggests that PCB levels may be decreasing in Long Island Sound. Contact Fred Thurberg, FTS 642-5244 or (203) 783-4200.

BLEAK OUTLOOK FOR YELLOWTAIL FLOUNDER

The Center's just completed 1985 winter survey of yellowtail flounder off Southern New England indicates a bleak outlook for this resource. This survey was a continuation of the cooperative winter survey series run by the fishing industry, the Rhode Island Division of Fish and Wildlife, and the Center during 1980, 1981, and 1983. The 1985 survey showed abundance lower than at any time since these surveys began. Catches of prerecruit yellowtail were also low, indicating that recruitment to this year's fishery will be poor. There appears to be little chance for improvement in this resource in the near future. Contact Steve Clark, FTS 840-1312 or (617) 548-5123.

FISHING PRESSURE INCREASES ON COD; DECREASED STOCKS ANTICIPATED

An assessment of 1984 U.S. commercial fisheries data and 1984 Center bottom trawl survey data for the Georges Bank and Gulf of Maine Atlantic cod stocks indicates that fishing mortality has markedly increased on both stocks. Since 1981, fishing mortality on cod has doubled on Georges Bank and quadrupled in the Gulf of Maine. In both stocks, the rates are the highest in over 20 years, exceeding even those when foreign fleets were exploiting New England waters in the mid-1960's.

This increased fishing mortality stems from increased fishing effort on cod as other fisheries resources (e.g., haddock, redfish, and yellowtail flounder) have declined. The current levels of fishing mortality are much in excess of the levels producing the maximum yield per recruited fish, and should they continue, further declines in cod abundance are anticipated. Contact Fred Serchuk, FTS 840-1245 or (617) 548-5123.

STONE CRABS FOUND TO HAVE TWO POPULATIONS

The stone crab, *Menippe mercenaria* (Say), ranges in the Western North Atlantic from Cape Lookout, North Carolina, to the Greater Antilles and Belize, and around the perimeter of the Gulf of Mexico in shallow subtidal depths to a maximum of 50 meters. According to data published in 1984, the U.S. fishery for this crab -- mainly along the west coast of Florida -- has grown from reported landings of 752,000 pounds and 233,000 dollars in 1964 to 3,274,000 pounds and 3,071,000 dollars in 1977.

Studies now indicate distinct differences both in color and in larval and adult morphology between a stone crab population in the northern Gulf of

Mexico and another population in the rest of the range. The National Systematics Laboratory is evaluating the systematic status of these populations in collaboration with D.L. Felder of the University of Southwestern Louisiana. Contact Austin Williams, FTS/(202) 357-2639.

NORTHEAST FISHERIES CENTER

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VIRUS EPIDEMIC IN RARITAN BAY'S WINTER FLOUNDER

Contractors for the Northeast Monitoring Program have found an epidemic of lymphocystis disease in Raritan Bay's winter flounder. Daily samples showed between 78 and 94 percent of the flounders with evidence of the disease -- small pearl-like growths on the fins and skin. Common terms for the disease are "seedy flounder" or "scabby flounder."

Lymphocystis is a viral disease, is not usually fatal to fish, and runs its course in about 24 weeks in otherwise healthy fish. The virus seems to be induced by stress such as that which accompanies spawning activity. The disease is specific for fish and does not harm humans or affect edibility of the flounder -- an important point considering the major recreational fishery for winter flounder in Raritan Bay. Contact Joanne Stolen or Robert Reid, FTS 342-8200 or (201) 872-0200.

POPULATION-CRIPPLING DISEASE FOUND IN MASSACHUSETTS OYSTERS

At the request of the Commonwealth of Massachusetts, the Center examined oysters from West River, Massachusetts, for MSX *(Haplosporidium nelsoni)* disease. Forty-eight percent of the samples had this population-crippling disease.

Because Wellfleet Harbor, Massachusetts, is the only other area in that state where MSX is known to cause significant oyster kills, the West River outbreak may have been caused by the introduction of oyster seed purchased from other states. Such introductions, either intentional or unintentional, of nonnative organisms (with the potential for those organisms to carry debilitating diseases) looms as one of the long-term problems in fisheries management. In cooperation with Massachusetts and other New England states, the Center is attempting to identify possible sources of any contaminated seed in the West River area. Contact Fred Kern, (301) 226-5193.

COPPER AND CADMIUM MAY AFFECT SCALLOP RECRUITMENT

In the laboratory, we have found that in clean, flowing seawater, the weight of sea scallop gametes (eggs and sperm) increased by 100 percent during gonad maturation. However, in water laced with 20 ppb of copper, the gamete weight decreased by 67 percent. In water with 10 ppb of copper, the gamete weight initially decreased by 33 percent, but then increased to recover its initial weight. But, if similarly low levels of cadmium are also in the water, even the recovery is prevented.

The bottom line is that a number of urban centers abutting the Gulf of Maine (a body of water with important inshore scallop grounds) regularly dump treated and untreated municipal wastes and sewage sludge which often contains copper and cadmium at levels well above our laboratory test levels. Contact Edith Gould, FTS 642-5222 or (203) 783-4222.

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The Northeast Fisheries Center's "Monthly Highlights" is a selection of brief popularized accounts of Center research activities in the preceding month. These accounts focus on the practical applications of research findings to fisheries resource and habitat conservation. The name and telephone number of a Center scientist has been included at the end of each account to contact for more information.

A RESURGENCE OF GEORGES BANK HERRING?

We collected postlarval (30-40 mm) Atlantic herring at three locations on eastern Georges Bank during the April MARMAP survey. This is the second consecutive year that we have located young herring on the once-productive Georges Bank spawning beds which have now been dormant since the 1970's. Although preliminary observations indicate that catch numbers were low, their mere presence is encouraging. We must await the fall and winter surveys before evaluating the spawning success. However, because of the widespread catches of large larvae -- larger than we would expect to catch in our fine-meshed plankton nets unless they were relatively abundant -- there is a glimmer of optimism among Center scientists that a resurgence of the Georges Bank herring stock may be underway. Contact Wallace Smith, FTS 342-8260 or (201) 872-0200.

MACKEREL EGG MORTALITY -- INDICATED BY CHROMOSOME ABNORMALITIES -- AGAIN ASSOCIATED WITH COASTAL POLLUTION

Similar to earlier studies based on a few sample sites, a recent study based on the many sample sites of a 1979 MARMAP survey shows a trend in Atlantic mackerel embryos of higher frequencies of chromosome abnormalities with closer proximities to nearshore polluted areas. This is the fourth year class of mackerel in which genetic indicators of egg mortality have been associated with coastal pollution. Contact Dean Perry, FTS 642-5215 or (203) 783-4215.

ULCER OUTBREAK CONTINUES IN ATLANTIC COAST MENHADEN

The outbreak of ulcer disease in Atlantic menhaden and other estuarine species which began 1984 appears to be persisting into 1985. Reports from the field indicate that this disease is now present in fish from Florida to upper Chesapeake Bay. The population impacts of this disease cannot yet be determined, but surveillance continues. Contact Aaron Rosenfield, (301) 226-5193.

SCALLOP AQUACULTURE SUFFERS SETBACK IN PERU

Perhaps because of El Nino, the Peruvian coast south of Lima now has an abundant supply and active fishery for a scallop, *Argopecten purpuratus*, similar to our bay scallop. To increase the harvest, Peruvian aquaculturists have been collecting seed and growing scallops in net enclosures in Paracas Bay. The aquacultural harvest last year returned three million dollars. Earlier this year, the Peruvian aquaculturists stocked 500 million seed on 1,300 hectares of leased bay bottom, expecting a return of 24 million dollars.

However, anoxia occurred during March, partly due to an illegal dumping of 8,000 metric tons of rotting fish into the bay, which depleted the bay's bottom oxygen. All scallops perished. A Center scientist, in Peru for a symposium on mollusk culture, observed the damage firsthand, and made preliminary recommendations on studies of the bay's carrying capacity and anoxic conditions. Contact Edwin Rhodes, FTS 642-5226 or (203) 783-4226.

L. Blownlow

NORTHEAST FISHERIES CENTER

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ARE TUNAS AND MACKERELS HIGHLY MIGRATORY ?

Under the Magnuson Act, any "highly migratory" species cannot be unilaterally managed by the United States within its Fishery Conservation Zone. Consequently, the question of whether a given species is highly migratory or just highly mobile is important to fisheries interests.

In this context, the 36th Tuna Conference, held at Lake Arrowhead, California, during May 21-24, addressed the *scientific* aspect of this question for tunas and their relatives (family Scombridae). National Systematics Laboratory Director Dr. Bruce B. Collette began the conference with an overview of the distribution patterns of tunas and their relatives, and convened a session on distribution. Four distributon patterns were recognized: worldwide (12 species), oceanwide (6 more-shore-associated species), one side of an ocean (13 coastal species), and restricted distributions within the Indo-Pacific (18 species). Only a few species of tunas, such as the bluefin, southern bluefin, albacore, and perhaps the bigeye, seem truly migratory, although some individuals of other species of tunas, such as skipjack and yellowfin, may move large distances at times. Contact Dr. Bruce B. Collette, FTS 357-2524 or (202) 357-2524.

NO RADIOACTIVITY HAZARD IN MASSACHUSETTS BAY SEDIMENTS & BENTHIC ORGANISMS

In 1981 and 1982, the Center collected sediment and benthic organisms from a Massachusetts Bay dumpsite where radioactive wastes had been previously deposited. The EPA analyzed these samples and concluded that radioactivity in the sediments and benthic organisms, including fish and larger invertebrates, was not above natural or "ambient" levels. Contact Frank W. Steimle, Jr., FTS 342-8259 or (201) 872-0200.

WALLEYE (ALASKA) POLLOCK PRODUCTS NEED IMPROVEMENT

The U.S. Department of Commerce's Northeast Inspection Service has concerns over the quality of some fishery products made from walleye or Alaska pollock (*Theragra chalcogramma*) and sold in the Northeast. The Center has concerns too, not only over the effect of less-than-desirable quality walleye pollock products on the marketing, sales, and consumption of those products, but also, through "guilt by name association," on the marketing, sales, and consumption of the Northeast's traditional Atlantic pollock (*Pollachius virens*) products.

Accordingly, the Center evaluated five products made from walleye pollock: fillets from a frozen layer pack, raw breaded center cuts, raw breaded fillets, raw breaded nuggets (small pieces), and breaded precooked nuggets. Our sensory panel scored all products as "liked slightly" to "moderately liked," except the breaded precooked nuggets which were "liked moderately" to "liked very much." Results show that the flavor and texture of most products need improvement. Contact Burton L. Tinker, FTS 837-9217 or (617) 281-3600.

U.S.-SPAWNED SALMON MAKE UP LARGER SHARE OF CANADIAN CATCH IN FALL & EARLY WINTER

During a May 6-8 meeting in Bangor, Maine, the International Council for the Exploration of the Sea's (ICES) Working Group on Atlantic Salmon reviewed tagging data collected by the Maine Atlantic Sea-Run Salmon Commission since 1970. Meeting participants found that U.S.-spawned salmon are being caught by Canadians throughout their June to December fishing season, and that the proportion of the catch made up of U.S.-spawned fish jumps significantly during September to December. The heaviest catches in the Canadian coastal fishery come from northeastern Newfoundland.

The North Atlantic Salmon Conservation Organization (NASCO) requested the ICES meeting, in part, because of U.S. concerns that the level of catches in the Canadian coastal fishery could prevent the United States from effectively restoring and maintaining its spawning stocks. NASCO will consider the meeting's findings in setting regulations for the Canadian coastal fishery. Contact Anne M.T. Lange, FTS 840-1301 or (617) 548-5123.

ICES NAMES CENTER SCIENTIST AS STATISTICIAN

The International Council for the Exploration of the Sea (ICES) recently named the Center's Dr. Emory D. Anderson as its new Statistician. Anderson assumes his new post on August 1 at ICES headquarters in Copenhagen, Denmark. Contact Dr. Michael P. Sissenwine, FTS 840-1239 or (617) 548-5123.

AFS'S NORTHEAST DIVISION INSTALLS CENTER SCIENTIST AS PRESIDENT

The American Fisheries Society's Northeast Division recently installed the Center's Dr. Fredric M. Serchuk as its new President. The installation occurred at the Division's annual meeting during May 6-8 in Hartford, Connecticut. Contact Dr. Michael P. Sissenwine, FTS 840-1239 or (617) 548-5123.

MILFORD LABORATORY HOLDS OPEN HOUSE

The Center's Milford (Connecticut) Laboratory held an open house on May 16. About 2,000 people, including 500 inner-city school children, visited the facility. Attractions included an introductory slide show, a chat with "Oliver the Talking Oyster," a touch tank where live animals could be picked up and examined, and numerous displays on research activities. Contact Sheila Stiles or Edwin W. Rhodes, Jr., FTS 642-5200 or (203) 783-4200.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
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Northeast Fisheries Center
Woods Hole, Massachusetts 02543

JUNE 1985

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"MONTHLY HIGHLIGHTS" & BIMONTHLY REPORT" COMBINED

The Center has combined its "Monthly Highlights" with its "Bimonthly Report" to create an expanded "Monthly Highlights." The merger begins with this issue. Those who formerly received the "Bimonthly Report" will now receive the "Monthly Highlights" instead. A key part of the old "Bimonthly Report," the listing of the Center's recent scientific publications and reports, will continue in the new "Monthly Highlights", but only in every third issue (i.e., quarterly). Contact Jon A. Gibson, FTS 840-1228 or (617) 548-5123.

DRAFT NATIONAL ARTIFICIAL REEF PLAN AVAILABLE

The National Fishing Enhancement Act of 1984 requires that a National Artificial Reef Plan be developed to guide artificial reef builders and managers. Copies of the draft plan--to which Center personnel contributed--are available from Richard B. Stone, National Marine Fisheries Service, Room 420, Page Building 2, 3300 Whitehaven Street, N.W., Washington, DC 20235. (Mark envelope "National Artificial Reef Plan".) Contact Frank W. Steimle, Jr., FTS 342-8259 or (201) 872-0200.

U.S. ATLANTIC SALMON SUFFER SETBACK AT "CONSERVATION" MEETING

During the second annual meeting of the North Atlantic Salmon Conservation Organization (NASCO) in Edinburgh, Scotland, during June 3-7, no management measures were adopted by any of the three Regional Commissions--North American, West Greenland, or North East Atlantic. The United States had proposed that the North American Commission close the commercial interception fishery off Labrador and Newfoundland from September 1 to December 31. This closure would reduce Canada's annual total Atlantic salmon catch by approximately one percent, but would reduce the interception of those salmon returning to U.S. homewaters by about 23 percent.

Canada would not agree to the U.S. proposal because she failed in the West Greenland Commission to get a reduction in the 870-metric-ton total allowable catch in the West Greenland fishery which would have further protected Canadian-origin salmon. The U.S. delegation rejected, as contrary to the intent of the NASCO treaty, Canada's linking the developments in one Commission to those in another Commission. However, opportunities have been left open for further discussions prior to the opening of the commercial interception fishery. Further U.S. diplomatic efforts are underway to urge Canada to reconsider her position. Contact Dr. Vaughn C. Anthony, FTS 840-1304 or (617) 548-5123.

COOPERATIVE SURVEY BEGINS FOR PELAGIC GAMEFISH CATCHES IN THE NORTHEAST

The Center, in cooperation with seven other organizations, has begun a survey to estimate catches and obtain biological samples from tunas, billfishes, and sharks in the Northeast. Data come from random telephone and dockside interviews and from coverage of selected sportfishing tournaments from New York to Virginia. Survey results to date indicate that during May little offshore fishing occurred. Through mid-June, though, fishing picked up with sharks the primary target and catch from Maryland north, and school bluefin tuna the target and catch in Virginia. Contact Darryl J. Christensen, FTS 342-8241 or (201) 872-0200.

VIRAL EPIDEMIC IN RARITAN BAY'S WINTER FLOUNDER CONTINUES; RECREATIONAL FISHING INDUSTRY HURT

In the March issue we reported an epidemic of lymphocystis in Raritan Bay's winter flounder. Lymphocystis is a highly infectious viral disease which appears as pearl-like tumors on the skin and fins. It usually does not kill the fish but leaves it weakened and more vulnerable to predation. In the past three months we have examined 1,700 flounders from this area; between 75 and 100 percent of the fish from each sample have been infected. They are underweight and apparently not feeding. The area's party boat captains are now reporting significantly smaller catches than in previous years.

Both the duration and intensity of this epidemic suggest that a stress-inducing factor is behind this disease outbreak, perhaps chemical contamination. The Center continues to monitor the epidemic in the field, examine the immune response of the fish in the lab, and evaluate habitat quality. Contact Stuart J. Wilk, FTS 342-8201 or (201) 872-0200.

OIL-RICH FISH REAFFIRMED AS HEALTH FOOD

The National Marine Fisheries Service, together with the National Institutes of Health and the National Fisheries Institute, sponsored an international conference on the role of fish oil in human health in Washington, D.C., during June 24-26. More than 125 preeminent biochemists met to review research to date and to suggest directions for new research. The conference reaffirmed that oil in finfish and shellfish may help ward off heart disease, stroke, arteriosclerosis, and inflammatory diseases.

As a backdrop to the conference, one of the Northwest Atlantic's most oil-rich seafood species, the Atlantic mackerel, remains the region's most underutilized resource for the U.S. fishery. At the beginning of 1985, the stock was estimated to be more than 2.6 billion pounds, with the total catch for the year expected to be less than six percent of that biomass. Contact Jon A. Gibson, FTS 840-1228 or (617) 548-5123.

EDIBILITY CHARACTERISTICS DEVELOPED FOR SEVERAL NORTHWEST ATLANTIC GROUNDFISH

A hurdle to increasing domestic consumption of nontraditional seafood species involves having consumers rely less on the market names (e.g., scrod, lemon sole) of fishery products and more on the edibility characteristics (e.g., firm, mild) of such products--particularly if the market names are unfamiliar or unappealing. Accordingly, the federal government is developing an edibility "profile" (e.g., texture, flavor) of each actual and potential seafood species.

The Center has recently developed such profiles for the flavor and texture of silver hake, "scrod" Atlantic cod, goosefish, and Atlantic wolffish. We made two profiles for each species, for storage on ice of one day and six days after being caught. The six-day-old iced samples approximate fish available in supermarkets. Preliminary results show only a slight difference in the one-day-old and six-day-old samples. Contact Joseph M. Mendelsohn, FTS 837-9242 or (617) 281-3600.

ATTACK & COUNTERATTACK ON SQUID AS SEAFOOD

A mid-June article in the *Boston Herald* newspaper severly criticized the eating of squid. The author said squid had a rubbery texture and little use other than fish bait. We wrote a letter to the editor rebutting some of the arguments raised in the article and offered to furnish recipes for delicious squid dishes. The public response surprised us because it was so swift and voluminous. Letters are still pouring in requesting recipes. Copies of the recipes are still available. Contact Vincent G. Ampola, FTS 837-9285 or (617) 281-3600.

CENTER ANNUAL REPORT AVAILABLE

The Center has issued its 1984 "End-of-Year Report." The report contains a two-page overview of the major issues in marine fisheries research last year, and a listing of one-sentence descriptions of those Center research activities which produced information directly and immediately usable by one or more of our constituent groups. Copies are available. Contact Jon A. Gibson, FTS 840-1228 or (617) 548-5123.

WOODS HOLE LAB CELEBRATES CENTENNIAL; HOLDS RESEARCH & MANAGEMENT FORUMS

The Center's Woods Hole Laboratory is 100 years old. The Lab's centennial celebration will feature two forums on August 15 ("Fisheries Research Strategy for the Future" and "Fisheries Management Strategy for the 1980's and Beyond") and a Lab rededication on August 16.

Participants in the research forum will be: Carl R. Sullivan, Moderator (Executive Director, American Fisheries Society); Dr. Peter Larkin (Professor, University of British Columbia); Dr. John L. McHugh (Professor, State University of New York); Dr. Gilbert C. Radonski (President, Sport Fishing Institute); and Dr. William F. Royce (international fisheries consultant, Seattle, Washington). Participants in the management forum will be: Richard H. Schaefer, Moderator (Northeast Regional Director, National Marine Fisheries Service); Alan D. Guimond (Chairman, New England Fishery Management Council); Robert L. Martin (Chairman, Mid-Atlantic Fishery Management Council); Jeff Pike (Assistant to U.S. Representative Gerry E. Studds); Dr. Gilbert C. Radonski; and Lucy Sloan (Executive Director,

National Federation of Fishermen.

Among dignitaries attending the rededication ceremony will be: Dr. Anthony J. Calio (Acting Administrator, NOAA); William G. Gordon (Assistant Administrator for Fisheries, NOAA); and higher-level federal officials as circumstances permit. Contact Dr. Marvin D. Grosslein, FTS 840-1252 or (617) 548-5123.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

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JULY 1985

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STATES FUNDED FOR IMPROVED ASSESSMENT OF CHESAPEAKE BAY FISHERIES RESOURCES

To better assess Chesapeake Bay's fisheries resources, NOAA has funded cooperative research agreements with the Maryland Department of Natural Resources, the Virginia Institute of Marine Science, the District of Columbia, and Pennsylvania State University. The funding -- about 855 thousand dollars total -- will yield about two years of research in which : (1) the District of Columbia will survey the fisheries resources available to its urban anglers; (2) the Maryland Department of Natural Resources and the Virginia Institute of Marine Science will determine the short- and long-term factors affecting mortality of the Bay's key recreational and commercial species (striped bass, spot, blue crab, American oyster, etc.), as well as upgrade its data bases on fisheries statistics; and (3) Pennsylvania State University will statistically analyze the data gathered by the others. The Center will coordinate all research.

This research, which will complement the recent federal effort to begin restoring Chesapeake Bay's economic, recreational, and environmental attributes, should ultimately help us sort out the reasons (fishing, pollution, habitat degradation, and natural environmental/biological factors) for population changes in the Bay's key species. Contact Dr. John G. Boreman, Jr., FTS 840-1225 or (617) 548-5123.

HAGFISH TABBED AS MAJOR PROBLEM FOR DEEPWATER LOBSTERING

Using a NOAA-chartered research submersible, the Harbor Branch Foundation's Johnson-Sea-Link, the Center has confirmed its suspicions that hagfish can be a major problem in the deepwater lobster fishery. During four dives in late June at Jordan Basin (Central Gulf of Maine), Center scientists observed hagfish -- primitive eel-like creatures closely related to sea lampreys -- consuming up to 90 percent of the bait (usually redfish or Atlantic herring "racks") within 24 hours from commercially fished lobster traps. Amphipods, crabs, and shrimps also came into the traps to finish off the bait. We obtained excellent videotapes and photographs to document this hagfish activity.

This bait loss from deepwater traps either creates a major problem or raises a serious question. On the one hand, it creates a major problem if the presence of bait in the traps is essential for attracting lobsters. A typical deepwater lobsterman will set about 1,000 traps, filling them with about 1,000 dollars of bait, and hauling them every week. If hagfish are consuming 90 percent of the bait soon after the trap is set, then current baiting practices are very inefficient.

On the other hand, it raises a serious question if the traps are effectively fishing more than 85 percent of the time (i.e., six out of seven days) with little or no bait. In fact, earlier underwater observations by Center scientists, as well as fishing experiences by some Long Island offshore lobstermen, suggest that deepwater lobsters are attracted to traps not because of the bait, but because of the shelter they can provide on an otherwise featureless bottom. Contact Joseph R. Uzmann, FTS 840-1272 or (617) 548-5123.

CENTER ADVISES ON CONTROLLING DISEASE OUTBREAK IN SHELLFISH HATCHERY

The Center has advised a commercial shellfish hatchery on controlling a disease outbreak in its juvenile stock. First, we identified the disease agent -- the marine bacterium Pseudomonas. Second, we suggested remedial actions which included: (1) removing ammonia (used as a nitrate source) from the hatchery's algal culture system to prevent Pseudomonas from replicating; and (2) disinfecting the culture tanks and water pipes to keep the bacterium from reappearing. Contact Dr. Walter J. Blogoslawski, FTS 642-5235 or (203) 783-4235.

TECHNICAL WORKSHOP HELD ON STOCK ASSESSMENT

During July 8-12, the Center held its first technical workshop on stock assessment. Sixty-five attended, representing seven Northeast state marine fisheries agencies, the New England and Mid-Atlantic Fishery Management Councils, the Northeast Regional Office, and the Center. The workshop reviewed the adequacy of 33 species or species groups assessments, assigned a priority to each assessment, identified future assessment research needs, discussed cooperation between federal and state agencies in upgrading assessments of mutual interest, and suggested new ways to conduct assessments.

Bluefish received a surprisingly high ranking for future assessment research, not only because of its current importance to the Northeast's fishermen (principally recreational), but because of the relative lack of assessment-type data on it. Contact Dr. Vaughn C. Anthony, FTS 840-1304 or (617) 548-5123.

CENTER TRAINS INDONESIANS IN FISHERY TECHNOLOGY

The Center recently trained four food technologists and technicians of Indonesia's Research Institute for Fish Technology. During the two-week training program, the Center demonstrated techniques in fish processing & storage, refrigeration, fish quality, microbiology, and sanitation. We also arranged for the Indonesians to tour Gloucester, Massachusetts, fish processing plants and the Massachusetts Shellfish Depuratin Plant at Plum Island. Contact Robert J. Learson, FTS 837-9313 or (617) 281-3600.

RECENT PUBLICATIONS AND REPORTS

(Reprints of the following publications and copies of the following reports are available upon written request to: Information Services Section, Northeast Fisheries Center, Water Street, Woods Hole, Massachusetts 02543.)

Colton, J.B., Jr., J.L. Anderson, J.E. O'Reilly, C.A. Evans-Zetlin, and H.G. Marshall. 1985. The shelf/slope front south of Nantucket Shoals and Georges Bank as delineated by satellite infrared imagery and shipboard hydrographic and plankton observations. NOAA Tech. Mem. NMFS-F/NEC-38. 28 pp.

Higgins, B.E., R. Rehfus, J.B. Pearce, R.J. Pawlowski, R.L. Lippson, T. Goodger, S.M. Roe, and D.W. Beach. 1985. Regional action plan: Northeast Regional Office and Northeast Fisheries Center. NOAA Tech. Mem. NMFS-F/NEC-37. 93 pp.

Lange, A.M.T., and J.E. Palmer. 1985. USA historical catch data, 1904-82, for major Georges Bank fisheries. NOAA Tech. Mem. NMFS-F/NEC-39. 24 pp.

Laurence, G.C., and R.G. Lough. 1985. Growth and survival of larval fishes in relation to the trophodynamics of Georges Bank cod and haddock. NOAA Tech. Mem. NMFS-F/NEC-36. 166 pp.

Lough, R.G., G.R. Bolz, M. Pennington, and M.D. Grosslein. 1985. Larval abundance and mortality of Atlantic herring (Clupea harengus L.) spawned in the Georges Bank and Nantucket Shoals areas, 1971-78 seasons, in relation to spawning stock size. J. Northw. Atl. Fish. Sci. 6: 21-35.

Norton, V.J., M.M. Miller, and E. Kenney. 1985. Indexing the economic health of the U.S. fishing industry's harvesting sector. NOAA Tech. Mem. NMFS-F/NEC-40. 47 pp.

Pearce, J.B., C.R. Berman, Jr., and M.R. Rosen, eds. 1985. Annual NEMP report on the health of the Northeast coastal waters, 1982. NOAA Tech. Mem. NMFS-F/NEC-35. 79 pp.

Sinclair, M., V.C. Anthony, T.D. Illes, and R.N. O'Boyle. 1985. Stock assessment problems in Atlantic herring (Clupea harengus) in the Northwest Atlantic. Can. J. Fish. Aquat. Sci. 42(5): 888-898.

Valdimarsson, G., H. Einarsson, and F.J. King. 1985. Detection of parasites in fish muscle by a candling technique. J. Assoc. Off. Anal. Chem. 68(3): 549-551.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

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AUGUST 1985

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NORTHERN SHRIMP SURVEY COMPLETED; PROSPECTS FOR WINTER FISHERY THE SAME OR BETTER THAN LAST YEAR

Center scientists and personnel from the Maine Department of Marine Resources, the New Hampshire Fish & Game Department, and the Massachusetts Division of Marine Fisheries completed the 1985 Gulf of Maine northern shrimp survey during August 6-16 aboard the Center R/V *Gloria Michelle*. Catches were highest off the central Maine coast from the Casco Bay - Jeffreys Ledge region eastward to Penobscot Bay and, as in preceding years, catches were dominated by shrimp hatched in 1982. Production appears to have been poorer in more recent years, although high catches of one-year-old shrimp were observed in some areas. Prospects for the 1985-86 winter fishery appear the same or better than those for 1984-85, particularly off the central Maine coast. Contact Dr. Stephen H. Clark, FTS 840-1312 or (617) 548-5123.

GEORGES BANK NOW CONTRIBUTING SIGNIFICANTLY TO SURF CLAM FISHERY

On July 25, the new surf clam fishery on Georges Bank concluded its first year as a commercial fishery. (Last year it was an "experimental" fishery.) Fishermen harvested almost 300 thousand bushels of surf clams since the beginning of the year -- about 10 percent of the Northeast's total harvest. Particularly important were the more than five million pounds of meats worth more than two million dollars in ex-vessel prices landed in Massachusetts -- an industry for that state that didn't exist two years ago.

The Center continues to monitor the Georges Bank surf clam populations and fishery as part of its stock assessment efforts. In the past 12 months, the Center has conducted its biennial surf clam/ocean quahog research vessel survey (which includes Georges Bank), has sampled catches at sea on commercial vessels (which include three vessels fishing Georges Bank surf clams), and since the beginning of the year has sampled landings at all major fishing ports where surf clams are landed (which include Provincetown and New Bedford, Massachusetts, where hundreds of clams have been statistically sampled from 18 vessel landings). Contact Dr. Steven A. Murawski, FTS 840-1303 or (617) 548-5123.

MULTISPECIES ASSESSMENT OF GEORGES BANK GROUNDFISH COMPLETED

The Center has completed a multispecies assessment of four key stocks -- Atlantic cod, haddock, pollock, and yellowtail flounder -- in the Georges Bank bottom trawl fishery. The purpose of this joint assessment was to determine the likely responses of these stocks in the next several years to possible fishery management changes such as larger mesh sizes, more area closures, and more effort restrictions.

The assessment suggests that if fishery managers seek to rebuild depleted stocks such as haddock and yellowtail flounder by reducing fishing mortality rates, then they would need to reduce overall fishing effort significantly. Further, the assessment suggests that any recovery of haddock and yellowtail could lead to catch reductions in cod and pollock. Contact Dr. William J. Overholtz, FTS 840-1256 or (617) 548-5123.

SUMMARY PREPARED FOR FLOUNDER RESOURCES ON THE "TAIL" OF THE GRAND BANKS

For the past half year, some American fishermen have been fishing the "Tail of the Bank" section of the Grand Banks of Newfoundland. The Tail of the Bank is a portion of the continental shelf which lies beyond the Canadian 200-mile limit, and thus, beyond Canadian fisheries jurisdiction. The Tail of the Bank does fall under the jurisdiction of the Northwest Atlantic Fisheries Organization for those nations who are members -- the United States isn't a member though. Consequently, the Tail of the Bank is international waters with no fisheries regulations for American fishermen.

To determine if the benefits of the potential harvests from the Tail of the Bank outweigh the costs of steaming to and from the area (about four days each way), New England fishermen recently requested the Center to assess the potential yields, current landings, and catch rates for flounder resources in that area. Using Canadian Department of Fisheries and Oceans scientific documents, the Center has summarized the requested information for American plaice, yellowtail flounder, and witch flounder. A significant amount -- more than 40 million pounds -- of American plaice remain unharvested from what the Canadians have determined to be that area's harvestable surplus. Contact Ralph K. Mayo, FTS 840-1310 or (617) 548-5123.

OFFSHORE NORTHWEST ATLANTIC FISH SCORE WELL DURING HEALTH EXAM

To monitor the health of offshore Northwest Atlantic fish, Center scientists recorded the incidence of external lesions and anomalies in those fish being processed for age & growth analysis during the second and third legs of this past spring's bottom trawl survey. We examined 6,459 fish, comprising 15 species, trawled from water normally deeper than 90 feet on Georges Bank, Nantucket Shoals, and the Gulf of Maine.

Eight species (silver hake, red hake, white hake, redfish, witch flounder, windowpane, fourspot flounder, and butterfish) were free of external lesions and anomalies. The other seven species (Atlantic cod, haddock, pollock, yellowtail flounder, American plaice, winter flounder, and summer flounder) had very low incidences.

Overall, prevalences of these non-life-threatening external lesions and anomalies were well under one percent for the 15 species surveyed. The health of these Northwest Atlantic offshore fish appears good and attests to a wholesome product. Contact Dr. Robert A. Murchelano, (301) 226-5193.

EDIBILITY PROFILES DETERMINED FOR HERRING, REDFISH, AND TUNA

As part of the Center's ongoing program to determine the edibility "profiles" of seafood species, we have just completed profiles of the flavor and texture of Atlantic herring, redfish, and bluefin tuna. For both herring and redfish, we made one profile for those fish held on ice for one day, and another for those held on ice for six days. Preliminary results show only a slight difference in the one-day and six-day iced samples.

For tuna, we made one profile for the head section and another for the tail section. The tail section had a much more "gamey" flavor than the head section. Contact Burton L. Tinker, FTS 837-9217 or (617) 281-3600.

NOAA AND EPA LAUNCH JOINT RESEARCH OF NORTHEAST'S ESTUARIES

With a Congressional mandate, NOAA and EPA recently signed a cooperative agreement for environmental research of the Northeast's estuaries. Research will focus on effects of physical and chemical degradation of estuarine habitats on major fish and invertebrate stocks. Long Island Sound, Narragansett Bay, and Buzzards Bay will be the first estuaries to be studied. Under the agreement, EPA will coordinate the research which will be conducted by states, universities, and NOAA (principally the Northeast Fisheries Center and the NOAA Ocean Assessment Division). Contact Helen Mustafa, FTS 840-1244 or (617) 548-5123.

CAUSE OF LARVAL DIE-OFF AT CONCH HATCHERY IDENTIFIED AND CORRECTED

During August 5-12, the Center investigated a major die-off in a commercial hatchery for Caribbean conchs (*Strombus gigas*). All three-day-old conch larvae were dying within 24 hours. Our preliminary research identified the cause of the die-off as the shellfish pathogen *Vibrio alginolyticus*, and found the pathogen in nearby seawater, inside seawater pipes, and in conch eggs.

The hatchery adopted the Center's recommendations to solve the immediate problem: treating all hatchery pipes with sodium hypochlorite solution, and dipping the conch egg masses in antibiotics. The Center also made recommendations to prevent future die-offs (e.g., weekly cleaning of seawater lines, using selective microbiological culture media to detect the pathogen's presence, installing an available ultraviolet disinfection system, handling diseased larvae and their rearing tanks in a sanitary manner), and gave a seminar to all hatchery employees on prevention and control of this bacterial disease. Contact Dr. Walter J. Blogoslawski, FTS 642-5235 or (203) 783-4235.

WOODS HOLE LABORATORY CENTENNIAL HELD; MANAGEMENT FORUM DEALS WITH CONTROVERSIAL ISSUES

During August 13-16, the Center's Woods Hole Laboratory -- the world's first facility to be specifically built for and dedicated to fisheries research -- celebrated its centennial. Centennial activities included: five public lectures on marine fisheries and the Laboratory's role in their development; two public forums on the future of fisheries research and management; a formal rededication ceremony; two public and one invited receptions; and a seafood luncheon.

A highlight of the celebration was the August 15 forum on the future of fisheries management. Key government, industry, recreational, and academic leaders in North American fisheries dealt with several management issues, including: (1) the decreasing chances for any new federal legislation or additional funding for marine fisheries in the foreseeable future; (2) the increasing role of marine recreational fisheries in the management process; and (3) the increasing discussion of controls on the number of harvesters of marine fisheries resources, much the same way there are now controls on the number of harvesters of other common property resources under federal stewardship (timber, minerals, etc.).

Verbatim proceeding of the lectures, forums, and ceremony will eventually be published. Anyone wishing to reserve a copy should request such --*in writing* -- from Dr. Marvin D. Grosslein, National Marine Fisheries Service, Northeast Fisheries Center, Woods Hole, MA 02543.

NEW METHOD DEVELOPED TO AGE SOFT-SHELL CLAMS

Center scientists have developed a new method to determine the age of two species of soft-shelled clams (*Mya arenaria* and *M. truncata*). The method uses acetate "peels" of radially sectioned chondrophores (the part of the shell which anchors the hinge cartilage).

Preliminary results from using the new method have yielded distinct age/growth lines. We will next attempt to verify the accuracy of this method by using it on known-age specimens. Contact John W. Ropes, FTS 840-1287 or (617) 548-5123.

COMPUTER PROGRAM DEVELOPED TO MAP SEA SCALLOP SURVEY CATCHES

We have developed a computer program which maps research vessel survey catches of sea scallops within each of our standard sea scallop sampling "strata," or zones, on the Northeast continental shelf. These maps should greatly clarify the catch-per-strata data in future issues of the Center's sea scallop stock assessment documents. Contact Dr. Fredric M. Serchuk, FTS 840-1245 or (617) 548-5123.

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SEPTEMBER 1985

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FIRE DAMAGES CENTER'S SANDY HOOK LABORATORY

A fire in the early morning of September 21 leveled one of the two buildings comprising the Center's Sandy Hook (New Jersey) Laboratory. None of the 35 Laboratory personnel who normally worked in the burned building were hurt. Several firefighters received only slight injuries.

The Sandy Hook Laboratory is the site for a significant amount of the Center's research for habitat management. Also, because of its location, the Laboratory is the source for some of the Center's data on the fisheries of coastal New York and New Jersey.

Losses due to fire include: (1) chemistry labs, instruments, samples, and data; (2) behavior aquaria, equipment, specimens, and data; (3) benthic ecology labs and data; (4) life history data for major Mid-Atlantic fish and invertebrate stocks; (5) reference collections and data for fish eggs and larvae; (6) survey data for fish distribution and abundance in the New York Bight area; (7) statistical data on the Northeast's fisheries; and (8) a 35,000-volume research library.

Center officials are dealing with the short-term problem of how to recover essential data and provide emergency working conditions for Laboratory personnel. Administration and Congressional officials are joining Center officials in dealing with the longer-term problem of how to restore research capabilities.

For more information, contact Anne L. Studholme, FTS 342-8200 or (201) 872-0200.

LARGER SIZE LIMITS PROPOSED FOR STRIPED BASS

A committee of the Atlantic States Marine Fisheries Commission (ASMFC) has proposed larger size limits for striped bass.

The Center participated in a recent meeting of the ASMFC's Scientific & Statistical Committee on Striped Bass which was held, among other things, to determine what size limits would protect the 1982 and later year classes until 95 percent of their females had a chance to spawn at least once. The conclusion of the September 10 and 11 meeting in Annapolis, Maryland, was 33 inches by fall 1986 and 37 inches by fall 1987. The Commission currently recommends states to have a 24-inch limit in their coastal fisheries.

Dominant year classes maintain the Atlantic Coast's migratory stock of striped bass. The last such year class -- the largest in 30 years -- was the 1970 year class of the stock's Chesapeake Bay population. The 1982 year class of the Chesapeake Bay population, although it's below the long-term average, is nonetheless slightly stronger than other recent year classes. The ASMFC is trying to protect this and later year classes to increase the chances for successful spawning.

For more information, contact Anne M. Lange, FTS 840-1301 or (617) 548-5123.

JUVENILE SEA SCALLOP ABUNDANCE IMPROVES IN MID-ATLANTIC

Preliminary results of the Center's 1985 summer sea scallop survey indicate that juvenile sea scallop abundance in the Mid-Atlantic (Long Island to Cape Hatteras) has markedly increased from the low levels of the past four years. The 1985 survey abundance index of precommercial size scallops (less than 70-millimeter shell height) was the second highest in the 10-year scallop survey time series, and was three times higher than any of the 1981-84 survey indexes.

This increased abundance is due to successful recruitment of the 1982 year class, particularly in the New York Bight and Delmarva areas. The survey showed the greatest concentrations of this year class between Long Island and Maryland in depths between 25 and 40 fathoms. These scallops should reach commercial size (a 40-meat-per-pound count or lower) by the end of 1986 and the beginning of 1987.

For more information, contact Dr. Fredric M. Serchuk, FTS 840-1245 or (617) 548-5123.

ASSESSMENT OF RECENT CANADIAN REGULATIONS ON CANADIAN HARVEST OF U.S.-ORIGIN SALMON

Recent Canadian regulations may have slightly reduced the Canadian harvest of U.S.-origin Atlantic salmon.

The Center participated in a recent meeting of the International Council for the Exploration of the Sea's Atlantic Salmon Working Group, held to advise the North Atlantic Salmon Conservation Organization's North American Commission on the level of Canadian harvests of U.S.-origin salmon, and the impact of recent Canadian regulations in reducing those harvests. The recent Canadian regulations include closing several areas, shortening the length of the season in several areas, and reducing the amount of licensed fishing gear in Newfoundland and Labrador.

From the September 16-20 meeting in Woods Hole, the Working Group estimated that the closed areas and shortened seasons should have reduced the 1984 and 1985 Canadian harvests of U.S.-origin salmon by 11 percent. The Working Group could not estimate the impact of the gear reductions based on the available data. The North American Commission will use the Atlantic Salmon Working Group's conclusion in developing its management plans.

For more information, contact Dr. Vaughn C. Anthony, FTS 840-1304 or (617) 548-5123.

SEA SAMPLING SHOWS DOGFISH DISCARD HIGH, GROUNDFISH CATCH LOW

The Center conducted at-sea sampling on two Gloucester-based commercial fishing vessels during September.

The first trip -- a day-trip to Stellwagen Bank for spiny dogfish -- showed a 71 percent discard rate for small dogfish. Although the Northeast's population of spiny dogfish has a high abundance (estimated at more than 600 million pounds last year), it also has a low reproductive potential. (Mature females produce only an average of six live offspring every two years.) Since the fishery already selects large females (greater than 30 inches and five pounds) because of market conditions, there could be concern if such high discard rates of small dogfish became common in coming years. European studies of the Northeast Atlantic's dogfish fishery have shown that intense fishing for large females and high discarding of small fish have the potential to rapidly reduce dogfish populations.

The second sea sampling trip -- a five-day trip to Jeffreys Ledge for groundfish -- averaged only 542 pounds of landed catch per tow for the trip's 21 tows. Unfortunately, these very poor catches are typical of the current groundfish fishery. Discards averaged less than 100 pounds per tow and consisted mostly of skates with small amounts of Atlantic cod, haddock, silver hake, red hake, white hake, and flounders.

To begin obtaining discard data from Gloucester's small-mesh fishery on a regular basis, the Center has begun a program which involves cooperating Gloucester fishermen. Fisherman will randomly sample their discards and return the samples to the Center's fisheries statistics agent in Gloucester.

For more information, contact Thurston S. Burns, FTS 840-1309 or (617) 548-5123.

NAMES UPDATED FOR GULF-OF-MAINE FISHES

Since 1953, the basic reference for fisheries researchers in the Gulf of Maine has been *Fishes of the Gulf of Maine* by Henry B. Bigelow and William C. Schroeder. In those 32 years, though, our knowledge of the systematics and taxonomy of those fishes has improved, and the names of many fishes and categories of fishes have changed.

The Center and the Harvard University Museum of Comparative Zoology recently published a list of about 90 name changes which update the Bigelow and Schroeder text. Those persons who want to update their copies of the text should contact Dr. Bruce B. Collette, FTS/202 357-2552.

COMMON AND SCIENTIFIC NAMES COMPILED FOR NORTH AMERICAN CRUSTACEANS

A group of decapod crustacean specialists which includes a Center scientist, in collaboration with a committee of the American Fisheries Society (AFS), has prepared a draft list of common and scientific names of decapod crustaceans of America north of Mexico, including waters within 200 miles of the coast, but excluding islands of the West Indies. The list contains 410 true crabs, 336 shrimps, 318 lobsters and their relatives, and 274 hermit crabs and their relatives. A list of mollusks is also now in preparation.

Although the crustacean list is a draft for review, is incomplete, and is unavailable for general distribution, those persons whose work regularly requires such information (e.g., technical editors in fishery biology) can contact Dr. Austin B. Williams, FTS/(202) 357-2639.

CENTER'S GLOUCESTER LABORATORY HONORED

The 30th Annual Atlantic Fisheries Technological Conference celebrated the 25th anniversary of the Center's Gloucester (Massachusetts) Laboratory by holding a one-day "International Symposium on Fishery Technology" in the Laboratory's honor. About 230 people from 13 nations attended the Conference/Symposium; 82 papers were presented.

For more information on the proceedings of the Conference/Symposium, contact the Laboratory's Officer-in-Charge, Robert J. Learson, at FTS 837 9313 or (617) 281-3600.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

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OCTOBER 1985

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LARGE YEAR CLASS OF GEORGES BANK HADDOCK

The Center captured relatively high numbers of age 0 haddock during August and October bottom trawl surveys of Georges Bank. The abundance index for age 0 haddock captured during the October 1985 survey is about the same as the abundance index for age 0 haddock captured during the October 1975 survey. That 1975 year class was the largest year class to recruit to the Georges Bank haddock fishery since the 1963 year class.

The abundance of the spawning stock of Georges Bank haddock has been at a very low level in recent years. If the 1985 year class proves to be as large as the 1975 year class, then the 1985 year class could begin to replenish the depleted spawning stock when it recruits to that spawning stock in 1988. However, the level of replenishment of the spawning stock would depend upon the level of fishing mortality on the 1985 year class in the interim. Contact Dr. Marvin D. Grosslein, FTS 840-1252 or (617) 548-5123.

ILLUSTRATED GUIDE TO LOBSTER TAILS

The National Systematics Laboratory has prepared an illustrated guide to the lobster tails in U.S. trade, and has submitted the guide to *Marine Fisheries Review* for publication. Since federal law requires the correct identification of imported lobster tails, the guide will aid the U.S. Customs Service, the Department of Defense, the Food and Drug Administration, and other federal agencies.

The guide identifies the clawed, spiny, flat, and squat lobsters in U.S. trade, summarizes catch information on a worldwide basis, and outlines species distributions on a worldwide basis. Contents include keys for identification, color descriptions, geographic & bathymetric summaries, common names, black & white drawings, and selected views of tails in color. Landings are summarized for species groups and regions, with an emphasis on domestic production. Contact Dr. Austin B. Williams, FTS/(202) 357-2639.

EDIBILITY PROFILES DETERMINED FOR POLLOCK AND SCROD

As part of the Center's ongoing program to determine the edibility "profiles" of seafood species, we have just completed profiles of the flavor and texture of pollock and "scrod" Atlantic cod. Such profiles are an effort to enhance the marketability of traditional seafood species, and to improve the marketability of less traditional seafood species, by emphasizing their table characteristics instead of their market names.

For both pollock and scrod, we made one profile for those held on ice for one day, and another for those held on ice for six days. Preliminary results show only a slight difference in the one-day and six-day iced samples. Contact Burton L. Tinker, FTS 837-9217 or (617) 281-3600.

METHOD DEVELOPED TO ENHANCE NUTRITIONAL VALUE OF ALGAE FED TO CULTURED BIVALVES

The Center has developed a way to control the levels of protein, carbohydrate, and lipid in algae that are being produced in bulk to feed bivalve mollusks. Manipulating the levels of these cellular components will aid in maximizing the production of cultured algal-feeding bivalves. This has application not only for research organizations such as the Center which produce large numbers of bivalves for experimentation, but also for private

hatcheries which produce large numbers for commerce.

Specifically, the Center experimented with various concentrations and ratios of nitrate and phosphate used to enrich the growth medium for two algal species, *Tetraselmis maculata* and *Dunaliella tertiolecta*. When phosphate was held constant, the amount of protein relative to carbohydrate increased linearly with increasing nitrate for both species. Also, although *T. maculata* always contained more lipid than *D. tertiolecta*, when nitrate was reduced, the amount of lipid could be increased in the latter species. Contact Dr. Ravenna Ukeles, FTS 642-5223 or (203) 783-4223.

EPIDEMIC OF INFECTIOUS SARCOMA DISEASE IN CHESAPEAKE BAY'S SOFTSHELL CLAMS

The Center continues to assess the intensity and geographic range of an epidemic of infectious sarcoma disease in Chesapeake Bay's softshell clams, and to evaluate the disease's effects on clam populations and the clam fishery. Findings thus far are that: (1) the disease first appeared in Chesapeake Bay in 1978; (2) circumstantial evidence suggests that the disease was introduced by human transfer of infectious material from elsewhere, perhaps New England; (3) occurrence is now widespread, encompassing most of the productive areas of the Bay; (4) prevalences are extremely high, up to 90 percent in some populations; and (5) cumulative mortality, hitting 87 percent in one year in one tested population, has significantly reduced production over the past two years.

This disease has the potential to severely reduce softshell clam harvest in the near future (landings have already decreased), and may lead to major recruitment failure due to brood stock reduction. Contact Austin C. Farley, (301) 226-5193.

MSX DISEASE IN CAPE COD OYSTERS

MSX disease, caused by the pathogen *Haplosporidium nelsoni*, has appeared among the oyster populations along the south shore of Cape Cod. MSX disease doesn't affect humans who eat infected oysters, but the disease has historically decimated oyster populations in some Mid-Atlantic estuaries.

At the request of the Commonwealth of Massachusetts, the Center examined samples of oysters from the south shore of Cape Cod where a large oyster die-off is now occurring. Ninety-two percent of the oysters had MSX. This oyster disease is new to that area and is probably causing the die-off.

The Northeast's recent drought has decreased freshwater runoff and increased saltwater concentrations in the region's estuaries. The higher salinity in many areas favors the spread of MSX and has exposed many oyster populations to this highly infectious disease for the first time. Contact Frederick G. Kern III, (301) 226-5193.

SLOW MATURITY OF SANDBAR SHARKS CONFIRMED BY RECAPTURE OF TAGGED FISH

The Center has now obtained reliable data, through its NMFS Cooperative Shark Tagging Program, on the slow maturity of the sandbar shark. In October, the Center received a whole sandbar shark that had been tagged off Long Island, New York, in 1968 and recently recaptured off Panama City, Florida. (This is the longest time at liberty yet for a shark marked with an "M"-dart tag.)

A sportsman had tagged the shark 17 years ago at an estimated length of 48 inches; the fish measured 73 inches at recapture. Postmortem examination

showed the shark to be an immature female approximately 23-years old.

This recapture, which provided valuable scientific information, was made possible by the combined efforts of volunteer sportsmen, tournament officials at Panama City, and NMFS biologists at the Panama City Laboratory. Contact John B. Casey, FTS 838-7142 or (401) 789-9326.

REVISION OF SPANISH MACKERELS

National Systematics Laboratory scientists Bruce B. Collette and Joseph L. Russo have published their worldwide revision of the Spanish mackerels and seerfishes of the genus *Scomberomorus*. The monograph was published in Volume 82, Issue 4, of the *Fishery Bulletin*. This revision should stabilize the nomenclature of the genus and lay the foundation for study of populations and stocks needed for proper management of the Spanish mackerels.

The monograph recognizes 18 species, including two discovered and named during the research. Each species account includes synonymies, diagnostic characters, an illustration of the species, morphometric data, distribution, geographic variation, and summaries of biology and fishery interests. There are detailed descriptions of external morphology, soft anatomy, and osteology. Numerous illustrations supplement the morphological descritions. Contact Dr. Bruce B. Collette, FTS/(202) 357-2524.

SPECIES-SPECIFIC EFFECTS OF LOW DISSOLVED OXYGEN LEVELS OFF NEW JERSEY

The Center's intensive monitoring of dissolved oxygen levels in the New York Bight has uncovered some apparent species-specific effects of the periodic extremely low dissolved oxygen levels in that area. The Center has conducted this monitoring in coordination with the NOAA National Ocean Service, U.S. Environmental Protection Agency, and the New Jersey Department of Environmental Protection since 1976 when a severe episode of low dissolved oxygen ("hypoxia") killed over 500-million dollars of shellfish in a 2000-square-kilometer area along the New Jersey coast. Less severe kills have occurred before and since 1976.

During an episode of hypoxia accompanied by warm bottom-water temperatures in a 200-square-kilometer area along the New Jersey coast during late August and early September, divers from the Center and the American Littoral Society made observations and collected samples at a shipwreck in the hypoxic area. The combination of hypoxia and warm temperature killed ocean pout, a primarily boreal species. Slightly more tolerant species such as the lobster, while affected by the hypoxia, appeared to have survived although they may have been more vulnerable to predation while debilitated. Other species such as black sea bass and red hake apparently departed the area temporarily. Contact John E. O'Reilly, FTS 342-8251 or (201) 872-0200.

ROLE OF ACIDIFICATION IN ANADROMOUS FISH DECLINE

The Center participated in a recent conference on "Acidification and Anadromous Fish of Atlantic Estuaries," sponsored by the Hudson River Foundation. The conference convened experts from many fields to evaluate the role of acidification in the decline of several anadromous species.

General conclusions of the conference were that: (1) in many cases, hard evidence is not available to definitively assess the impacts of acidification, although suggestive trends do exist -- acidification has been clearly shown to be important in only a few estuarine ecological systems; and (2) acidification

alone probably has not caused recruitment failure of anadromous fish, but interactions between pH and other environmental factors such as contaminants are probably very important. Contact R. Anne Richards, FTS 840-1243 or (617) 548-5123.

CENTER DISCUSSES INDUSTRY ECONOMICS AND SCALLOP OUTLOOK WITH SEAFOOD DEALERS

The Center made presentations on industry economics and the sea scallop outlook to the New Bedford (Massachusetts) Seafood Dealers Association on October 19. In the first presentation, which dealt with trends in landings, revenues, and imports of all of the Northeast's major species, the Center discussed how the purchasing power of owners, captains, and crew members has diminished significantly since 1978 due, in part, to increasing costs per pound of fish landed and to stability of deflated ex-vessel fish prices. Also discussed were the growth of imports -- particularly cod products -- and the shift from frozen processed products to fresh whole products.

In the second presentation, which dealt with the state of the sea scallop fishery, the Center discussed an anticipated increase in recruitment in the Mid-Atlantic area by the end of 1986 or beginning of 1987. Contact Dr. Philip N. Logan, FTS 840-1354 or (617) 548-5123.

NMFS HOLDS ECONOMICS WORKSHOP; CENTER DISCUSSES SURF CLAM FISHERY

The NMFS held a workshop on fisheries economics in Rockport, Masachusetts, during October 16-17. The Center outlined its bioeconomic model of the surf clam fishery. Participants from the NMFS Washington Office, Regional Offices, and Fisheries Centers, as well as from the Regional Fishery Management Councils and several universities, discussed such models, the problem of recruitment of surf clams, and the ability to model trends in fisheries. Also reviewed were ongoing economic studies in the Regions and Centers. Contact Dr. Philip N. Logan, FTS 840-1354 or (617) 548-5123.

NEW ENGLAND HOSTS U.S.-JAPANESE AQUACULTURE PANEL

During October 15-22, the United States-Japan Natural Resources Panel in Aquaculture held its 14th annual meeting in New England. Ten Japanese scientists and their U.S. counterparts met in Woods Hole for a symposium on advances in biology and engineering with potential for aquaculture, and heard presentations on genetic engineering, growth hormones, tissue culture, micro-encapsulated diets, gamete cryopreservation, and other subjects. The Panel also discussed coordination of joint projects dealing with a registry of marine pathology, importation of marine species, scientific exchanges, and literature exchanges, and also developed a five-year plan for future meetings.

Scientific and business proceedings will be published in the *NOAA Technical Report NMFS* series. Contact Edwin W. Rhodes, FTS 642-5226 or (203) 783-4226.

SANDY HOOK LABORATORY CELEBRATES 25TH ANNIVERSARY

On October 25, the Center's Sandy Hook Laboratory celebrated its 25th anniversary with an open house. The Laboratory hosted over 2,000 visitors with marine films, diver exhibits, a touch tank for children, and research displays. A popular attraction was cooking and tasting nontraditional species provided by the Fulton Fish Market of New York City.

Participants in the open house included the American Littoral Society, National Park Service, New Jersey Marine Science Consortium, Marine Academy of Science and Technology, and U.S. Coast Guard Pollution Response Team from Governor's Island, New York. Contact Cathy Noonan, FTS 342-8205 or (201) 872-0200.

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Ropes, J.W. 1985. Modern methods used to age oceanic bivalves. Nautilus 99(2-3): 53-57.

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Sawyer, T.K., E.J. Lewis, M.E. Galasso, J.J. Ziskowski, A.L. Pacheco, and S.W. Gorski. 1985. Gill blackening and fouling in the rock crab, *Cancer irroratus*, as an indicator of coastal pollution. Pages 114-129 *in* B. Ketchum, J. Capuzzo, W. Burt, I. Duedall, P. Park, and D. Kester, eds. Wastes in the ocean, vol. 6: near-shore waste disposal.

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NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts 02543

NOVEMBER 1985

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The Northeast Fisheries Center's *Monthly Highlights* is a selection of brief popularized accounts of Center research activities during the month. These accounts focus on practical applications of research findings to fisheries resource and habitat management. The name and telephone number of a Center scientist has been included at the end of each account to contact for more information.

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National Marine Fisheries Service
Northeast Fisheries Center

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BANNER YEAR FOR SURF CLAM AND OCEAN QUAHOG HARVESTS

The ocean quahog fishery is headed towards a record harvest. The 1985 quota began at 4.4-million bushels. However, cumulative landings through mid-November are 12 percent above the rate that achieves this quota level. The quota has now been increased to 4.9-million bushels and effort has been decreased from seven to five days of allowable fishing per week. Even with the increased quota and decreased effort, the large landings may force an early closure to the year's fishery.

The Mid-Atlantic surf clam fishery (New York and south) is also headed towards a possible early closure. The 1985 quota is 2.65-million bushels. A high landings rate has led to a temporary closure from June 23 through July 4, and to an effort restriction from six hours of allowable fishing per week to six hours every other week. Although cumulative landings through mid-November are 13 percent below the rate that achieves this quota level, the landings rate has further increased due to a lowering of the minimum size limit, effective November 10, from 5 1/4 to 5 inches shell height.

The Georges Bank surf clam fishery closed in July when the 300-thousand-bushel annual quota was met. The Nantucket Shoals surf clam fishery's cumulative landings are 26 percent below the 200-thousand-bushel annual quota. Contact William E. Brey, (301) 226-5420.

NORTHERN SHRIMP ASSESSMENT CONFIRMS GOOD PROSPECTS FOR WINTER FISHERY

In the August issue, we reported that observations during the August survey of northern shrimp distribution and abundance in the Gulf of Maine showed good prospects for the upcoming winter fishery. A subsequent stock assessment by the Atlantic States Marine Fisheries Commission's (ASMFC) Northern Shrimp Technical Committee noted a 30-percent increase between 1984 and 1985 in the abundance (by weight) index of shrimp. This increased abundance index stems largely from growth of the 1982 year class. This year class has accelerated the increasing trend in northern shrimp abundance since the late 1970's, and will contribute to good catches for the next two years.

On November 6, the ASMFC established a December 1 - May 31 fishing season -- the maximum allowable under existing ASMFC policy. This winter's catch should exceed last winter's 6.6 million pounds which were worth more than three-million dollars in ex-vessel prices to fishermen. Contact Dr. Stephen H. Clark, FTS 840-1312 or (617) 548-5123.

HERRING AGAIN FAIL TO SPAWN ON GEORGES BANK

Our 15th year of fish egg and larvae surveys in the Northwest Atlantic showed the once-productive spawning beds of Atlantic herring on eastern Georges Bank to be dormant for the seventh consecutive year. We found no larvae over the eastern half of the Bank in October, and only two larvae during November and December.

These results contrast sharply with those of the 1960's and early 1970's when our estimates of larval herring abundance over the Georges Bank spawning beds routinely exceeded four larvae per square foot of surface area, and occasionally exceeded 40 larvae. First evidence of the downturn in herring spawning on the Bank appeared in the mid-1970's. By 1979, we collected no larvae east of 68° W longitude. During the 1980's, herring larvae have been scarce to absent.

Our 23rd year of autumn bottom-trawl surveys of finfish and squid distribution and abundance in the Northwest Atlantic also confirmed the lack of herring spawning on eastern Georges Bank. We collected fewer than 10 adults there this past autumn.

As recently as 1975, almost 300 million pounds of herring were harvested on Georges Bank. Contact Wallace G. Smith, FTS 342-8260 or (201) 872-0200.

VIRUS MAY CONTRIBUTE TO BLUE CRAB DEATHS IN SHEDDING TANKS

Many dead and dying blue crabs from "shedding tanks" appear to have a virus which may contribute to their deaths. This observation occurred during a two-year cooperative study between the Center and the University of Maryland's Center for Environmental and Estuarine Studies. The cooperative study seeks to determine the cause and -- if possible -- develop a cure to the problem of excessive deaths of blue crabs while being held in flow-through or recirculating tanks for 10 or more days until they molt and become marketable as "soft-shelled" crabs.

Using light microscopy, we found 93 percent of our samples of dead or dying blue crabs that had been kept seven days or more in a recirculating system had signs of viral infections. Using electron microscopy on some of these same samples, we have confirmed the viral infections. After more samples have been subjected to electron microscopy, we should be able to better define the role of this virus in crab mortalities. Contact Dr. Phyllis T. Johnson, (301) 226-5193.

PROGRESS IN STUDY OF FISH OILS FOR FIGHTING HEART DISEASE

The NMFS Laboratories in Seattle, Charleston, and Gloucester have analyzed the composition of marine fish oils as part of a collaborative study designed ultimately to provide medical researchers with refined and standardized fish oils to be evaluated for their therapeutic effects in human heart disease. The initial results of the analysis appear comparable among the Laboratories, and following final statistical verification in December, will provide the quality assurance for the Gloucester Laboratory developing a "blueprint" for equipping facilities to produce pure fatty acids from marine fish oils. The purified fatty acids produced in this manner, rather than being tested directly in human feeding programs, will be tested indirectly in laboratory cellular experiments. Contact Judith Krzynowek, FTS 837-9226 or (617) 281-3600.

NEW BEDFORD FLOUNDERS WITH HIGH LEVELS OF LIVER DISEASE

While microscopically examining liver tissue from seven species of demersal fish collected along the Massachusetts coast, we found a significant numbers of the winter flounder from New Bedford's Clark Cove with areas of inflammed and dead liver tissue. This examination, a cooperative effort with the Massachusetts Division of Marine Fisheries, showed 42 percent of the flounders from the Cove to have liver lesions that could reasonably be interpreted to affect the health of these fish.

Fish from other areas along the Massachusetts coast had lower occurrences of such liver lesions. The species most affected, winter flounder, spends much of its time on the bottom within a relatively small territory, and the area in question, New Bedford, has bottom sediments with exceptionally high

concentrations of polychlorinated biphenyls or PCB's -- a known liver toxin. Contact Dr. Robert A. Murchelano, FTS 840-1263 or (617) 548-5123.

THAI ICHTHYOLOGIST TACKLES SYSTEMATICS STUDY OF INTEREST TO NMFS

Dr. Thosaporn Wongratana from Chulalongkorn University in Bangkok, Thailand, began a year-long Smithsonian Post-Doctoral Fellowship in November. Dr. Wongratana will work in a lab of the National Systematics Laboratory, revising his doctoral dissertation (University of London) on "Systematics of Clupeoid Fishes of the Indo-Pacific Region." This study is of particular interest to the Southwest Fisheries Center's Honolulu Laboratory because of the need to be able to identify bait fishes used in the tuna fishery of the Pacific islands. Many of the bait fishes are clupeoids, including herrings and anchovies, which are presently difficult to identify. Contact Dr. Bruce B. Collette, FTS/(202) 357-2552.

COMPUTER PROGRAM DEVELOPED TO AID PHYTOPLANKTON MEASUREMENTS

The Center has developed a computer program which saves time and aids accuracy in determining the kinds and amounts of chlorophyll pigments in seawater samples. Knowing the kinds and amounts of chlorophyll pigments permits the estimation of phytoplankton biomass -- the basis of marine food chains.

The computer program, written in the IBM Basic language, uses the "P.S." formula (part of the popular spectrophotometric procedure published in *A Practical Handbook of Seawater Analysis* by Strickland and Parsons in 1977) for pigment determinations. Computations of the formula are reduced from hours to minutes. The program also prompts the user for appropriate information, thus permitting use of the program by inexperienced personnel and reducing chances of errors in the final results. Contact Dr. Ravenna Ukeles, FTS 642-5223 or (203) 783-4223.

RECREATIONAL FISHERIES AND ENVIRONMENT DISCUSSED AT WALFORD CONVOCATION

The Center's Sandy Hook Laboratory recently held its seventh annual Lionel A. Walford Memorial Convocation. Theme of the Convocation was "Recreational Fisheries and the Environment -- Past, Present, and Future." U.S. Senator Frank Lautenberg keynoted the proceedings with his views on federal legislation dealing with fisheries management, and with his desire for maintaining federal facilities for marine fisheries research in New Jersey. Other speakers included Hal Lyman of *Salt Water Sportsman*, Christopher Weld of the National Coalition for Marine Conservation, Frank Daiber of the University of Delaware, and John Boreman of the Northeast Fisheries Center. The American Littoral Society and the New Jersey Marine Sciences Consortium cosponsored the program. Contact Anthony L. Pacheco, FTS 342-8290 or (201) 872-0200.

CENTER LIBRARIAN ELECTED PRESIDENT OF MARINE LIBRARY ASSOCIATION

The librarian of the Center's Woods Hole Laboratory, Judith Brownlow, was elected President of the International Association of Marine Science Libraries and Information Centers at that organization's annual meeting in Williamsburg, Virginia, during October 14-18. The 11-year-old organization includes 160 libraries from 17 countries, and promotes the exchange of information among such institutions. Contact Jon A. Gibson, FTS 840-1228 or (617) 548-5123.

Brownlow

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
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Northeast Fisheries Center
Woods Hole, Massachusetts 02543

DECEMBER 1985

IN THIS ISSUE:

EUROPEAN FISH STOCKS ON RISE; MIXED EFFECTS ON U.S. MARKETS

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WEAK 1985 YEAR CLASS OF CHESAPEAKE BAY STRIPED BASS

ROCK SHRIMP MONOGRAPH PUBLISHED

UPDATE ON FISHERY PRODUCT PRESERVATION RESEARCH

MODEL DEVELOPED TO EVALUATE DREDGING RESTRICTIONS ON OYSTER REPRODUCTION

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The Northeast Fisheries Center's *Monthly Highlights* is a selection of brief popularized accounts of Center research activities during the month. These accounts focus on practical applications of research findings to fisheries resource and habitat management. The name and telephone number of a Center scientist has been included at the end of each account to contact for more information.

EUROPEAN FISH STOCKS ON RISE; MIXED EFFECTS ON U.S. MARKETS

The outlook is good for several fish stocks in the Northeast Atlantic, notably the North-East Arctic cod stock and the Norwegian spring-spawning stock of Atlanto-Scandian herring. These assessments come from a recent meeting of the International Council for the Exploration of the Sea's Advisory Committee on Fishery Management.

An improved North-East Artic cod stock could have a mixed effect on U.S. markets. Norway, which obtains the bulk of her cod harvest from the North-East Arctic stock, was once the largest and still is a significant exporter of frozen cod blocks to the United States (i.e., 10 million pounds of frozen cod blocks as well as four million pounds of frozen cod fillets in 1984). In the next 3-4 years, she will have more frozen blocks and frozen fillets to export here. An increased supply of Norwegian blocks could lower the cost of supplies to U.S. firms which import these blocks to produce fish sticks and portions. (The recently declining U.S.-foreign exchange rate could nullify this advantage, though.)

Canada, a major exporter of both frozen cod blocks and fillets to the United States and Europe, may be prompted by the improved North-East Arctic cod stock to divert even more of her cod catch into the major markets for New England finfish -- fresh filleted and whole cod and other groundfish. Contact Dr. Fredric M. Serchuk, FTS 840-1245 or (617) 548-5123, for biological information, or Mikolaj Wojnowski, FTS 840-1348 or (617) 548-5123, for economic information.

COD JOIN HADDOCK WITH LARGE YEAR CLASS ON GEORGES BANK

In the October issue, we reported that the 1985 year class of Georges Bank haddock is large. Our continuing analysis of the data from our autumn research vessel survey of the Northwest Atlantic's fish populations has shown that the 1985 year class of Georges Bank cod may also be large. The survey yielded the second highest number of young-of-the-year cod since the surveys began in 1963. Only the number of young fish in 1975 exceeded the number in 1985.

Determining year-class sizes based on survey catches of young-of-the-year fish is not as certain for cod as it is for haddock. We will carefully monitor catches of 1985-year-class cod in the upcoming spring and autumn 1986 surveys in order to substantiate the results of the autumn 1985 survey. Based on our autumn 1985 survey values, though, the 1985 year class could eventually rejuvenate the sagging U.S. cod catch which -- according to preliminary data -- dropped in 1985 to a seven-year low of 80 million pounds. Contact Dr. Fredric M. Serchuk, FTS 840-1245 or (617) 548-5123.

WEAK 1985 YEAR CLASS OF CHESAPEAKE BAY STRIPED BASS

Water quality for most of the striped bass spawning grounds in Chesapeake Bay appeared adequate for larval survival in 1985. However, young-of-the-year stripers were scarce this year, indicating poor reproduction during the 1985 season. The State of Maryland's annual young-of-the-year (YOY) index, which is based on a survey with beach seines, was only 2.9 young stripers per seine haul. This 1985 index is lower than the 1984 index (4.2 fish per haul) and is only 9.4 percent of the highest index in the survey's history (30.4 fish per haul in 1970). These findings emerged from a December 10-11 Striped Bass Workshop which was sponsored by the Atlantic States Marine Fisheries

Commission.

Workshop findings also included further documentation on the size of the 1982 year class. That year class had the highest YOY index (8.4 fish per haul) since 1974, although it was not exceptional compared to the long-term average of 8.9 fish per haul. No quantitative information on the current abundance of the 1982 year class is available, however qualitative reports indicate that it remains the largest year class in recent years. Current management measures are aimed at protecting this and subsequent year classes to rebuild the spawning stocks. Contact Dr. R. Anne Richards, FTS 840-1357 or (617) 548-5123.

ROCK SHRIMP MONOGRAPH PUBLISHED

A monograph on the 12 species of rock shrimps (genus *Sicyonia*) occurring in the American Pacific has been published in the NMFS *Fishery Bulletin*. Until a few years ago, rock shrimps were discarded from the large commercial catches of penaeoid shrimps made in both the Eastern Pacific and Western Atlantic. It was formerly thought that, because of their hard shells, they would be rejected by consumers and the processing industry; however, increased demand for shrimp and new technology encouraged the fishermen and dealers to bring the larger of these species to market, and now the production is readily absorbed. Two species are well known: the ridgeback prawn (*S. ingentis*) on the West Coast and the brown rock shrimp (*S. brevirostris*) on the East Coast.

The monograph is based on the study of over 4,500 specimens. It contains a key to the species together with descriptions and color notes -- color pattern being invaluable for field identification. Maps of the range of each species (eight of which are extended beyond limits previously reported) are included, as well as information on reproduction, habitat, and indication of present or potential economic value. Contact Dr. Isabel Canet (Perez Farfante), FTS/(202) 357-1417.

UPDATE ON FISHERY PRODUCT PRESERVATION RESEARCH

Under experimental conditions, potassium sorbate significantly increased the shelf life of flounder fillets held on ice under refrigeration. The increased shelf life occurred both for fillets held in retail-like conditions and for fillets held in-plant or bulk-retail conditions.

In a different experiment to measure the natural loss of liquids from fillets during storage ("drip loss"), commercial quality flounder fillets showed more than a seven percent loss in weight after 12 days of storage in plastic containers surrounded by ice. "Market"-sized cod fillets showed about a three percent loss of liquids by weight after 11 days. Contact Vincent G. Ampola, FTS 837-9258 or (617) 281-3600, for potassium sorbate information, and Joseph M. Mendelsohn, FTS 837-9282 or (617) 281-3600, for drip-loss information.

MODEL DEVELOPED TO EVALUATE DREDGING RESTRICTIONS ON OYSTER REPRODUCTION

A recent workshop involving several state and federal agencies, including the National Marine Fisheries Service, and several academic institutions produced a model which evaluates channel-dredging restrictions on Chesapeake Bay oyster production. In assisting in development of the model, the Center stated that the major problem of channel dredging was the silting of oyster seed beds and consequent reduction of juvenile oyster abundance. Such silting

comes from the stirring of silt by the dredge's cutterhead, the leaking of silt between the dredge's pipe sections, and the spilling of silt-laden water over onshore levees.

The U.S. Army Corps of Engineers stated that the new design of suction dredge retains most silt and minimizes the silting problem. Contact Clyde M. MacKenzie, Jr., FTS 342-8200 or (201) 872-0200.

1978 YEAR CLASS CONTRIBUTING TO GULF OF MAINE REDFISH LANDINGS

During 1983 and 1984, landings of relatively small redfish increased substantially in the Gulf of Maine fishery despite a general decrease in overall redfish landings. The Center's autumn bottom-trawl surveys have consistently detected these fish in the inshore Gulf of Maine since the late 1970's, but 1983 was the first year that these fish recruited to the fishery. Age determinations of commercially landed redfish show these fish, which range from 8 to 11 inches, to be members of the 1978 year class.

Our analyses of the age composition of commercial landings suggest that the 1978 year class comprised 20 percent of total landings by numbers in 1983, and almost 50 percent in 1984. This pattern of recruitment is similar to that observed during 1976 and 1977 for the previously dominant 1971 year class. Our population-size analyses, however, indicate that the 1978 year class is only one-fourth as large as the relatively strong 1971 year class which has been supporting the Gulf of Maine fishery during the late 1970's and early 1980's. Prospects for further recruitment remain poor at least through 1990. Contact Ralph K. Mayo, FTS 840-1310 or (617) 548-5123.

Brownlow

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts 02543

JANUARY 1986

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National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center

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Deputy Center Director.....Dr. John B. Pearce
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CENTER REDUCES RESEARCH VESSEL ACTIVITIES TO MEET BUDGET CONSTRAINTS

The Center has deleted 88 "sea days" from its Fiscal Year 1986 schedule of cruises by the fisheries research vessels *Albatross IV* and *Delaware II*. This reduction is the Center's contribution to the overall reduction in sea days by the NOAA fleet to meet budgetary constraints imposed by the Deficit Reduction Act of 1985 (Gramm-Rudman-Hollings).

As part of the 88-day reduction, the Center will delete: (1) a cruise to monitor environmental quality of fish habitats from the Gulf of Maine to Chesapeake Bay; and (2) a cruise to study distribution, migration, and reproduction of apex predators (e.g., sharks, tunas, billfishes) along the East Coast. We are attempting to partially compensate for the loss of sampling time and data acquisition by "piggybacking" on other cruises. Contact H.C. Boyar, FTS 840-1235 or (617) 548-5123.

MONOGRAPH PUBLISHED ON MUD SHRIMPS OF EASTERN PACIFIC

A monograph has been published in the *San Diego Society of Natural History Memoir* series on the National Systematics Laboratory's study of mud shrimps (*Upogebia*) of the eastern Pacific between Alaska and the Galapagos Islands. The monograph recognizes 20 species from the region, 15 new to science and one an abortive introduction from the western Atlantic, possibly imported with oysters. Contact Dr. Austin B. Williams, FTS/(202) 357-2639.

DISEASES CONTINUE TO AFFECT OYSTER RESOURCES

Samples obtained in early 1985 indicate that both "MSX" (*Haplosporidium nelsoni*) and "Dermo" (*Perkinsus marinus*) are infecting oysters in the Maryland portion of Chesapeake Bay. Newspaper reports also indicate that MSX is infecting oysters in the Virginia portion of Chesapeake Bay and in Delaware Bay. Neither disease affects humans, but both diseases can seriously affect oyster populations, and thus, oyster harvests.

Environmental conditions, particularly above-average salinity levels, are similar to those during 1980-82 when there were major losses of oyster resources in both Maryland and Virginia. Below-average rainfall, leading to above-average salinity, promotes lethal infections of both MSX and Dermo. In 1985, water samples obtained from the same areas as the oyster samples showed salinity levels 3-5 parts per thousand above levels normally recorded. We would predict similar mortalities for Maryland oysters during 1986 should these drought conditions continue.

Oyster samples obtained during autumn 1985 from other areas reporting high oyster mortalities (New York, Connecticut, Massachusetts, and Georgia) indicate that MSX was the causative agent in the New England area, and Dermo the likely agent in Georgia. Contact Dr. Aaron Rosenfield, (301) 226-5193.

SUMMARY PREPARED ON WATER MASSES RECEIVING CHEMICAL WASTES AT THE 106-MILE DUMPSITE

Applied Science Associates, Inc., under contract to the Center, has completed a summary report on the water masses which receive chemical wastes dumped at the 106-Mile Dumpsite. The Dumpsite, which is located about 120 nautical miles east of Cape May (New Jersey) in water that is 7,300-9,000 feet deep, is a designated site for disposal of industrial wastes. It has also just become a designated site for disposal of sewage sludge to be barged from

such municipalities as New York City.

The report states that of the 370-million gallons of chemical wastes dumped at the site in the past decade, 66 percent went into slope water, 17 percent into shelf water, 13 percent into warm-core rings, 2 percent into the Gulf Stream, and 2 percent into unknown waters. About one-fifth of the time, the site was overlain by shelf water, carrying along with it the pelagic fishes normally found in the outer shelf environment, potentially exposing them to the dumped chemical wastes. Contact Dr. Merton C. Ingham, FTS 838-7138 or (401) 789-9326.

REFRIGERATED SEAWATER IMPROVES QUALITY OF LANDED FISH

On-board holding of fish in refrigerated seawater, as opposed to holding them on ice, improves the overall quality, shelf life, and market value of commercial landings. This conclusion stems from a study conducted by White Dove, Inc., of Cape May, New Jersey, and funded through a National Marine Fisheries Service grant. The study compared the two different on-board preservation techniques using such Mid-Atlantic species as butterfish, scup, silver hake, Atlantic mackerel, black sea bass, bluefish, weakfish, summer flounder, long-finned squid, and short-finned squid.

For a copy of the study's completion report, contact Daniel W. Baker, FTS 837-9269 or (617) 281-3600.

SALT CONTENT MODERATE IN BRINE-DIPPED COD FILLETS

Dipping fillets in a salt (sodium chloride) brine is a common practice in fish processing. The brine dipping, among other things, retards moisture loss and gives an attractive sheen. Because consumers are increasingly interested in the salt content of the foods they eat, the Center is studying the salt content, and the factors affecting salt content, in brine-dipped fish fillets of several species.

Preliminary results show the salt content of brine-dipped Atlantic cod fillets sampled from retail markets to be moderate, i.e., 20-130 milligrams of salt per 100 grams of fillet. We are currently examining winter flounder fillets for those factors (fillet size, dipping time, etc.) which affect salt uptake during brine dipping. Contact Elinor M. Ravesi, FTS 837-9287 or (617) 281-3600.

LONG ISLAND SOUND FIRST SUBJECT OF CENTER'S INCREASED ESTUARINE RESEARCH

The Center has both increased ad focused its estuarine research because: (1) we have found that while offshore fish habitats are generally healthy, many inshore habitats are degraded; and (2) the federal government has increased its attention to estuarine degradation. Center estuarine research will emphasize reproductive success, survival, and recruitment of key fish and bivalve mollusks in Northeast estuaries (e.g., Long Island Sound, Narragansett Bay, Buzzards Bay) subjected to contaminant effects. Physiology, biochemistry, genetics, pathology, ecology, analytical chemistry, and stock assessment studies will all be undertaken.

In this first year of study, the focus will be the reproductive success of winter flounder and hard clams in Long Island Sound. Contact Dr. Anthony Calabrese, FTS 642-5240 or (203) 783-4240.

METHOD DEVELOPED TO RAPIDLY DISPLAY OCEANOGRAPHIC DATA

The Center has developed a relatively rapid method to display computerized, geographically associated, oceanographic data for irregularly -- rather than rectangularly -- shaped areas of the ocean. Such irregularly shaped areas usually result from political, topographic, etc., features (e.g., Georges Bank).

The new method, called Interactive Geographic Onscreen Retrieval, or IGOR, has been developed using an IBM PC-XT personal computer and a VAX 11/780 computer, although the method can be adapted to other computers. Use of IGOR cuts the time for retrieving data for irregularly shaped areas from several weeks to less than a half hour. Contact Steven M. Atran, FTS 342-8270 or (201) 872-0200.

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FEBRUARY 1986

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The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

ATLANTIC MACKEREL STILL INCREASING

Atlantic mackerel appear to be continuing an increase that started in 1981. Recent assessment of the Northwest Atlantic mackerel stock suggests that it is approaching the high abundance observed in the late 1960's and early 1970's. The stock peaked at 4.2 billion pounds in 1970-71. Large 1981, 1982, and 1984 year classes are contributing to this resurgence.

Catches in the U.S. domestic and joint-venture fisheries have increased every year since 1977 and totaled 14.7 million pounds in 1985. The total mackerel catch (all countries) reached 125.4 million pounds in 1985, and will probably increase in 1986. A joint research fishery now being conducted by the United States and Poland with the Polish vessels *Admiral Arciszewski* and *Lutjan* has taken large amounts (i.e., about four million pounds for the month) of mackerel from Hudson Canyon south to Chesapeake Bay. Contact Dr. William J. Overholtz, FTS 840-1256 or (617) 548-5123.

SILVER HAKE REASSIGNED TO TWO STOCKS INSTEAD OF THREE

The Center has completed a study on delineating stocks of Northwest Atlantic silver hake. We now recognize two stocks: a Gulf of Maine-Northern Georges Bank stock and a Southern Georges Bank-Middle Atlantic stock. Prior to this major study, we had recognized three stocks: Gulf of Maine, Georges Bank, and Southern New England-Middle Atlantic.

These findings will immediately improve our accuracy in assessing this species, and will ultimately improve the ability for managing it throughout its range. Contact Frank P. Almeida, FTS 840-1308 or (617) 548-5123.

ASSISTANCE TO LOBSTER RETAILERS WITH HOLDING-WATER PROBLEMS

Center chemists recently assisted two New Jersey lobster retailers in solving water quality problems in their holding tanks. In one case, a mass mortality occurred soon after the water was changed. Oxygen levels were low in the tanks following the mortality, but not in the new bay bottom water when the tanks were refilled. We found the potential for a rapid depletion of the oxygen, though, because of high phytoplankton levels in the bay's bottom waters resulting from light penetrating through the clear surface waters of winter. We recommended aerating the water for several days before the lobsters were added.

In the other case, the retailer wanted to use cold well water to save on chilling costs. We found the well water to be anoxic, slightly sulfidic, and only moderately saline. We recommended a system to oxygenate the water, remove the sulfide, and raise the salinity. Contact Andrew F. Draxler, FTS 342-8254 or (201) 872-0200.

SODIUM CONTENT OF BRINE-DIPPED FLOUNDER FILLETS LINKED TO DIPPING TIME, BRINE STRENGTH

In the last issue, we mentioned our study of the salt (sodium) content, and factors affecting salt content, in brine-dipped fillets. (Fish processors commonly dip fillets in salt brine to retard moisture loss and give an attractive sheen.) This month's work with winter flounder shows non-dipped fillets with about 40-50 milligrams of sodium per 100 grams of fillet -- moderately low by FDA standards. The table below shows the milligrams of sodium in 100 grams of flounder fillet for various brine dipping times and brine strengths:

strength (percent)	time (seconds) 30	60	90
05	180 mg	-	-
10	280 mg	340 mg	410 mg
15	440 mg	-	-

These data will have value for fish processors as they evaluate: (1) the moisture-retarding and appearance-enhancing aspects of brine dipping; and (2) the consumer's interest in the sodium content of seafood products. Contact Elinor M. Ravesi, FTS 837-9287 or (617) 281-3600.

FIRST ANALYSIS OF SEDIMENT CONTAMINANTS IN NORTHEAST ESTUARIES AS PART OF "S&T" PROGRAM

We have analyzed sediment samples from several Northeast estuaries for 17 metals, 14 of which are possible contaminants. The samples come from the first round of sampling under NOAA's Status & Trends ("S&T") Program which is looking at long-term changes in the environmental quality of the nation's coastal and estuarine habitats. The estuaries for which we have first analyzed sediments are those we expect to be most polluted -- Raritan-Hudson, Long Island Sound, Narragansett Bay, Boston Harbor, and Salem Harbor.

As expected, the Raritan-Hudson system had the highest concentrations for most heavy metals, followed by Boston Harbor. However, the highest concentrations of chromium (2,950 ppm) and cadmium (9.44 ppm) were from Salem Harbor. We have previously seen such levels of cadmium only at sewage sludge dumping sites. We are now analyzing sediments from estuaries we expect to be least polluted. Contact Vincent S. Zdanowicz, FTS 342-8232 or (201) 872-0200.

METHOD ADAPTED FOR CLONING OYSTERS

The Center has adapted a method of cloning American oysters. This gives us the potential to develop a population of genetically identical oysters for research activities such as testing the effects of various types and levels of pollutants. Cloned organisms may be useful for pollutant-effect tests because the organisms' responses aren't influenced by any differences in the organisms themselves. Contact Sheila Stiles, FTS 642-5224 or (203) 783-4224.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

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MARCH 1986

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SUBSTANTIAL U.S. LANDINGS FROM THE "TAIL OF THE BANK" IN '85

Over 12.5 million pounds of groundfish, particularly flounders, were landed in 1985 by U.S. trawlers fishing an area of the Grand Banks of Newfoundland known as the "Tail of the Bank." The Tail of the Bank is a portion of the continental shelf which lies beyond the Canadian 200-mile limit, and thus in international waters.

A total of 133 bottom trawl trips by U.S. vessels accounted for 8.4 million pounds of yellowtail flounder, 2.9 million pounds of American plaice, and 0.6 million pounds of witch flounder. Of the principal ports involved in this fishery, Rockland, Maine, accounted for 41 percent of total landings, New Bedford, Massachusetts, for 29 percent, and Portland, Maine, for 27 percent. In the case of yellowtail flounder, landings from the Tail of the Bank represented a significant share of the total 1985 U.S. landings of this species, exceeding those from any other yellowtail stock off New England by more than 2.2 million pounds. Contact Ralph K. Mayo, FTS 840-1310 or (617) 548-5123.

SEA SCALLOP CATCH HITS 10-YEAR LOW

U.S. landings of sea scallops in the Georges Bank, Mid-Atlantic, and Gulf of Maine fisheries declined in 1985 to 14.9 million pounds of meats -- the lowest in 10 years. Last year marked the seventh consecutive year of decline. The value of the 1985 landings dropped to 71.8 million dollars, almost 23 million dollars less than 1984, and less than any year since 1977. The average ex-vessel (i.e., dockside) price per pound of meat was $4.82 in 1985, down from $5.53 in 1984. Although fishing effort in 1985 was only down three percent from the record high 1984 level, the catch rates in all three fisheries fell to record low levels.

Sea scallop abundance will increase in 1986 due to strong recruitment from the 1982 year class in the Mid-Atlantic region and the U.S. portion of Georges Bank. This increased abundance should be reflected in increased U.S. landings in the latter half of 1986 and during 1987 as scallops from the 1982 spawning attain legal size. Contact Dr. Fredric M. Serchuk, FTS 840-1245 or (617) 548-5123.

SCALLOP IMPORTS REACH RECORD HIGH

Scallop imports to the United States totaled a record 42.0 million pounds in 1985, a 54 percent increase from 1984. Major exporters to the United States were Canada (11.8 million pounds of Atlantic sea scallops), Peru (11.4 million pounds of purple or "Ostion" scallops), and Japan (10.9 million pounds of "hotategai" scallops). All of these scallop species are marketed as "sea scallops."

Scallop imports should remain high in 1986, although there will likely be a pronounced shift among the major exporting nations. Imports from Canada should markedly increase due to increased abundance of commercial-sized sea scallops in the Canadian portion of Georges Bank resulting from outstanding recruitment of the 1981 year class. Imports from Peru, however, should decline sharply. In January 1986, the Peruvian Minister of Fisheries totally banned scallop harvesting until at least May 1986 due to past overfishing and aquacultural failures.

Although U.S. sea scallop landings should increase in 1986, our calico scallop landings (39 million pounds of meats in 1984) will likely be reduced

due to resource depletion and closure of fishing grounds resulting from the Space Shuttle *Challenger* salvage operations. The market for imported scallops thus appears strong. Contact Dr. Fredric M. Serchuk, FTS 840-1245 or (617) 548-5123.

BOOK PUBLISHED ON VARIABILITY & MANAGEMENT OF LARGE MARINE ECOSYSTEMS

A Center scientist and a University of Rhode Island geographer are editors of a just-released book which deals with the natural and manmade changes in large marine ecosystems (LME's) that affect fisheries. An LME is an extensive area in which the fisheries resources are ecologically linked as a result of continuity and similarity in the area's bottom configuration, oceanic currents, temperature ranges, and other unique environmental and biological conditions. Our Northeast shelf is one of the United States' eight LME's.

The book, *Variability and Management of Large Marine Ecosystems*, is the result of a special symposium held during the 1984 annual meeting of the American Association for the Advancement of Science. It specifically covers: (1) how to determine long-term, broad-scale changes in LME's; (2) how to partition these changes into natural and manmade causes; and (3) options for government to prevent or counter the causes that are detrimental to our fisheries. Contact Dr. Kenneth Sherman, FTS 838-7142 or (401) 789-9326.

SATELLITE MONITORING OF SEWAGE SLUDGE DUMPING AT THE 106-MILE DUMPSITE

Center scientists are monitoring infrared data from NOAA satellites to identify the water masses receiving sewage sludge at the 106-Mile Dumpsite. By identifying the various water masses receiving the sludge and then following the movements of these water masses, we should know where the sludge--and its contaminants--will ultimately be distributed in the marine environment.

Sludge dumping began at the 106-Mile Dumpsite on March 17 when the first load arrived from New York City. Over the next 21 months, the sludge dumping rate there will increase as sludge normally bound for the 12-Mile Dumpsite is diverted to the more distant, deeper-water site. By December 1987, dumping at the 12-mile site will cease; all sludge from the New York Metropolitan Area will then be dumped at the 106-mile site under a five-year EPA permit.

The Center uses the University of Rhode Island's Oceanographic Remote Sensing Laboratory to receive infrared images from NOAA satellites of sea-surface temperatures for the area in and around the 106-Mile Dumpsite. Large differences in these sea-surface temperatures within a short distance across the surface usually indicate a boundary between two water masses, and thus can delineate the locations of the various water masses in and around the dumpsite. The Center has now begun to superimpose an outline of the dumpsite location over the boundaries of the water-mass locations in order to estimate the percentage of sewage sludge ending up in each water mass. Contact Kenneth Barton, (401) 792-6837.

ANNUAL REPORT ON EMERGENCY STRIPED BASS STUDY

In conjunction with the NMFS Washington Office and the U.S. Fish and Wildlife Service, the Center contributed to the 1985 Annual Report to Congress on the Emergency Striped Bass Study. The report, soon to be publicly released, notes that the 1985 young-of-the-year indexes were low for most striper production areas, including the Hudson River. The report also notes that laboratory experiments suggest that contaminants may limit larval survival. In 1985, though, water quality in the Chesapeake area appeared adequate for survival of young. Contact Dr. R. Anne Richards, FTS 840-1347 or (617) 548-5123.

NEW SHRIMP SPECIES DISCOVERED ON MID-ATLANTIC RIDGE

Caridean shrimps were discovered in a hydrothermally active area of the Mid-Atlantic Ridge during a NOAA VENTS Program cruise on the NOAA research vessel *Researcher* during July-August 1985. This discovery will be adding one genus and two species new to science. Contact Dr. Austin B. Williams, FTS/(202) 357-2639.

LIST OF 1985 CENTER PUBLICATIONS & REPORTS

The Center will soon have available a list of its 1985 publications and reports. To obtain a copy when the list becomes available, write: "1985 Publications List," Northeast Fisheries Center, Woods Hole, MA 02543, or contact Judith Brownlow, FTS 840-1260 or (617) 548-5123.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

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APRIL 1986

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COMMERCIAL DATA COLLECTION NOW COMPUTER-AIDED FOR MOST OF NORTHEAST

Commercial fisheries data collection is now computer-aided in all Northeast states except New Hampshire, Connecticut, and Delaware. Center port agents for Rockland, Me., Provincetown, Mass., Newport and Pt. Judith, R.I., Long Island, N.Y., Pt. Pleasant, N.J., and Hampton, Va., have completed their in-service training with the IBM-PC microcomputer and the computer programs developed by the Center called CODES (commercial data entry system). Port agents in Portland, Me., Gloucester, Boston, and New Bedford, Mass., and Cape May, N.J., had earlier adopted CODES. Accuracy has increased and turnaround time seems to be decreasing as a result of the new system. Contact Ronnee L. Schultz, FTS 840-1264 or (617) 548-5123.

U.S.-CANADIAN MEETING ON NORTHWEST ATLANTIC FISHERIES RESEARCH

During early April, the Center hosted the eighth annual meeting of U.S. and Canadian government fisheries scientists designed to promote awareness and cooperation in Northwest Atlantic fisheries research. These meetings have increased in importance since the partitioning of Georges Bank and the Gulf of Maine between U.S. and Canadian exclusive economic zones.

Topics discussed at the meeting included: (1) U.S. and Canadian finfish and shellfish research vessel survey sampling designs, gear comparisons, data exchanges, and data analysis; (2) U.S. and Canadian ichthyoplankton research vessel sampling designs and gear comparisons; (3) environmental factors affecting recruitment; and (4) stock assessment methodology, data needs, and future cooperation. Additionally, ad hoc working groups (shellfish, groundfish, cooperative surveys, gear behavior, etc.) were formed to address specific issues which arose during the discussions. A summary report on the meeting is available. Contact Dr. Tim D. Smith, FTS 840-1251 or (617) 548-5123.

FACT SHEETS FOR SEAFOOD CONSUMERS

We have developed a series of fact sheets for seafood consumers. The fact sheets cover: "Worms and Other Parasites," "Poisonous Fish," "Food Poisoning and Seafood Handling," "Red Tide," and "Radionuclides and Food Irradiation." These fact sheets are the Center's contribution to a New England Marine Advisory Council-sponsored project to develop a packet of fact sheets which can be used to uniformly and factually answer questions from the public and news media concerning seafood contamination. The Massachusetts Division of Marine Fisheries and the New England Fisheries Development Foundation will coordinate development and distribution of the fact sheet packets. Contact Dr. Joseph J. Licciardello, FTS 837-9236 or (617) 281-3600.

CENTER DEVELOPS IN-HOUSE ABILITY TO TEST FISH FOR LEVELS OF CERTAIN TOXINS/CARCINOGENS

The Center has passed a test of its in-house ability to measure concentrations of certain chemical contaminants in fish bile. The test compared the performance of the Center's analytical chemical facility at Gloucester with the National Marine Fisheries Service's national analytical facility at Seattle in measuring napthalene and benzo(a)pyrene--metabolites of aromatic hydrocarbons--in a pooled sample of bile from a West Coast flounder species. The test looks at the metabolites in the bile rather than at the

parent aromatic hydrocarbon compounds in the tissue in general because fish rapidly convert the aromatic hydrocarbons to various metabolic products.

The Center's in-house ability to measure these harmful metabolites will be used to test winter flounder from various Northeast sites as part of NOAA's Status and Trends Program which is monitoring long-term changes in the environmental quality of the nation's coastal and estuarine habitats. Contact Donald F. Gadbois, FTS 837-9286 or (617) 281-3600.

WORKSHOP ON CLAM SARCOMA DISEASE IN THE NORTHEAST

The Center and Rutgers University jointly held an early April workshop in Bivalve, New Jersey, to review and document the prevalence and mortality of infectious sarcoma disease in the Northeast's softshell clam populations. In addition to the well publicized sarcoma problems in Chesapeake Bay, workshop participants discussed the known or possible role of sarcoma in softshell clam die-offs in Maine, Massachusetts, Rhode Island, Connecticut, and New Jersey. Maine appears to have sarcoma in numerous sites with prevalences similar to those in Maryland, but with no field documentation on mortalities.

An histocytological method developed by the Center to diagnose infectious sarcoma disease in softshell clams was demonstrated to workshop participants. The participants agreed to adopt this method as part of a new, standardized, integrated study of the extent, intensity, mechanisms, and processes of infectious sarcoma disease in the Northeast. Contact Dr. Aaron Rosenfield, (301) 226-5193.

NEW SHRIMP SPECIES NAMED FOR CENTER SCIENTIST

A newly recognized species of shrimp, collected on the 1907-10 Philippine expedition of the original *Albatross*, has been named *Parapenaeus perezfarfantae* for a member (Isabel Perez Farfante) of the National Systematics Laboratory. Dr. Alain Crosnier of the French Office for Overseas Scientific Research and Technology, and the French National Museum of Natural History, authored the new species name. Contact Dr. Bruce B. Collette, FTS/(202) 357-2524.

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Judith Brownlow

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts 02543

MAY 1986

IN THIS ISSUE:

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TWO SPECIES OF FRIGATE TUNA OCCUR IN ATLANTIC

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MANUAL AVAILABLE ON HISTOLOGICAL TECHNIQUES FOR MARINE BIVALVE MOLLUSKS

POTASSIUM SORBATE PROLONGS SHELF LIFE OF CRAB MEAT

The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

ASSESSMENT WORKSHOP YIELDS REPORT ON 13 SPECIES

The Center has issued a report describing up-to-date assessments of the status of the stocks of 13 Northeast fish and invertebrate species. The report also identifies important limitations and alternative uses of this assessment information. Species covered were haddock, silver hake, white hake, red hake, redfish, yellowtail flounder, witch flounder, American plaice, butterfish, Atlantic mackerel, sea scallops, long-finned squid, and short-finned squid. The report was prepared during a May 5-9 workshop in Woods Hole which included participation by several state marine fisheries agencies, the New England & Mid-Atlantic Fishery Management Councils, the Southeast Fisheries Center, several universities, and other interested parties. Copies of the report are available as *Woods Hole Laboratory Reference Document No. 86-09*. Contact Dr. Tim D. Smith, FTS 840-1251 or (617) 548-5123.

ATLANTIC SALMON SMOLTS TAGGED

The Center, in cooperation with the U.S. Fish and Wildlife Service, sponsored the recent release of 150,000 hatchery-produced juvenile or "smolt" Atlantic salmon marked with external "Carlin" tags. One-hundred thousand tagged smolts were released in Maine's Penobscot River; 50,000 tagged smolts were released in the Connecticut River at Turners Falls, Massachusetts. These fish averaged 6-1/2 inches in length and bore the blue or green plastic tags in their backs. Additionally, a large number of smolts were tagged with internal coded-wire tags which can only be detected with special metal detectors. A sampling program has been established to retrieve these latter tags.

Anyone catching a Carlin-tagged Atlantic salmon 15 or more inches long is asked to return the tag with information on the fish's length and the catch gear/location/date to the Center's headquarters in Woods Hole. An eight-dollar reward and information on when and where the fish was released will be sent to the fisherman. However, any salmon less than 15 inches long (those not likely to have had a chance to migrate to the ocean where they would grow and mature) should be returned to the water. If the salmon has been tagged, the tag number, fish length, and catch information may be recorded prior to release. This information should also be forwarded to the Center.

Regulations regarding the capture of Atlantic salmon vary by state and river system, and apply to both tagged and untagged fish. Fishermen should be aware of those regulations pertaining to the area in which they fish. Contact Dr. Kevin Friedland, FTS 840-1344 or (617) 548-5123.

TWO SPECIES OF FRIGATE TUNA OCCUR IN ATLANTIC

The frigate tuna genus *Auxis* has been revised. The genus includes two worldwide species: *A. thazard*, the narrow corseleted frigate tuna, and *A. rochei*, the wide corseleted frigate tuna or bullet tuna. (Frigate tunas are not yet utilized in the United States, but world harvests annually exceed 100 thousand metric tons.)

The Indo-Pacific populations of both species are easily distinguished by differences in body proportions, color, and other characteristics. However, the Atlantic population of *A. rochei* differs morphologically from its Indo-Pacific population, making it difficult to distinguish it from *A. thazard*. This difficulty in distinguishing between the two species in the Atlantic, combined with the relative scarcity of *A. thazard* in the Atlantic, has mistakenly led to the belief that there was only one Atlantic species of *Auxis*. Contact Dr. Bruce B. Collette, FTS/(202) 357-2524.

WARM-CORE RING DAMAGES DEEPSEA LOBSTER FISHERY

Warm-core ring 86-A -- a cutoff meander of the Gulf Stream -- has swept away some lobster pots and apparently killed lobsters in some of the remaining pots in the canyons of southwestern Georges Bank. The pots were swept away by the ring's strong currents, and the lobsters were likely killed by the ring's warm waters (i.e., surface temperatures in the canyon area were 68° F. whereas surface temperatures on Georges Bank proper were 41-45° F.). Using NOAA satellites, the Center documented ring 86-A being formed in early January near 62° W longitude, drifting westward after that, and remaining near Hydrographer Canyon throughout May.

Similar warm-core rings have invaded the canyon areas of the Mid-Atlantic Bight and southern Georges Bank in the past, prompting many deepsea lobster and crab fishermen to monitor ring locations to avoid these kinds of problems. Fishermen can obtain information on the status of warm-core rings by contacting either Kenneth Barton, FTS 838-7138 or (401) 792-6837, or Reed S. Armstrong, FTS 838-7138 or (401) 789-9326.

CONTAMINANT LEVELS GENERALLY LOW IN OCEAN QUAHOGS

Scientists from the Center and Battelle New England Laboratory have jointly found that contaminant levels in the Northeast's ocean quahogs are generally low. The study looked at ocean quahogs which had been collected between Nova Scotia and Virginia for their levels of polychlorinated biphenyls (PCB's), polynuclear aromatic hydrocarbons (from both petroleum and combustion sources), total petroleum hydrocarbons, and trace metals (i.e., cadmium, chromium, copper, lead, nickel, silver, and zinc). The highest levels, although well below the FDA's action levels for these various contaminants, generally came from the inner New York Bight and Rhode Island Sound. Contact Frank W. Steimle, Jr., FTS 342-8259 or (201) 872-0200.

PARASITES DETECTED IN CLAMS SCHEDULED FOR INTRODUCTION TO SAMOA

At the request of the Interior Department, the Center examined a sample of giant clams (*Tridacna derasa*) from the waters of the Palau Islands which were scheduled to be introduced into the waters of American Samoa. We found 58 percent of the Palau giant clams to be infected with a parasitic metazoan worm. At the same time, we found no parasites in the giant clams (*T. maxima*) already native to American Samoa. To prevent the introduction of a potentially damaging parasite into the native clams of American Samoa, we provided the Interior Department not only with the results of our diagnostic examination, but also with guidelines developed by the International Council for the Exploration of the Sea designed to prevent such parasitic introductions. Contact Frederick G. Kern, (301) 226-5193.

MANUAL AVAILABLE ON HISTOLOGICAL TECHNIQUES FOR MARINE BIVALVE MOLLUSKS

The Center has produced a techniques manual for preparing high-quality histological sections and slides and related materials from marine mollusk tissues. The manual covers preservatives, fixation, blocking of tissues, stains, equipment, safety, and data management. A special feature throughout the manual are the tried-and-tested techniques for troubleshooting when unsatisfactory results are obtained. Copies are available. Contact B. Jane Swann, (301) 226-5193.

POTASSIUM SORBATE PROLONGS SHELF LIFE OF CRAB MEAT

Potassium sorbate was tested to see if and how much it can prolong the shelf life of fresh crab meat. Using common processing procedures, we briefly immersed freshly picked Jonah crab claw meat with either four-percent potassium sorbate or distilled water (the control). The control crab meat had a 10-11 day shelf life; the potassium sorbate-treated meat had a 17-18 day shelf life. Contact Vincent G. Ampola, FTS 837-9285 or (617) 281-3600.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

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JUNE 1986

IN THIS ISSUE:

PCB LEVELS IN BLUEFISH REPORTED TO CONGRESS

"GHOST" GILL NET SURVEY COMPLETED

ENVIRONMENTAL CONDITIONS SUMMARIZED FOR NORTHWEST ATLANTIC IN 1985

GAMBA PRAWN GENUS *PSEUDARISTEUS* REVISED

"PROFILES" DEVELOPED FOR FLAVOR AND TEXTURE OF FLOUNDERS AND TUNA

The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

PCB LEVELS IN BLUEFISH REPORTED TO CONGRESS

Preliminary findings of a one-year study by NOAA, EPA, and FDA on polychlorinated biphenyl (PCB) levels in Atlantic Coast bluefish suggest that seafood consumers who procure their bluefish through commercial sources aren't at a health risk since bluefish are only a portion of their seafood consumption. Those seafood consumers such as some recreational fishermen and their families though, who may consume bluefish day after day, year after year, might be at risk. Continuing analysis of the study's data should better define any categories of seafood consumers who might be at risk.

The study, in which the Center was significantly involved, collected 4,258 bluefish of all sizes between Massachusetts and Florida from January to November 1985, and performed over 1,200 chemical analyses. No bluefish -- regardless of the sampling site -- that had a length less than 20 inches had PCB levels above the FDA's two-parts-per-million action level. However, for those bluefish with a length more than 20 inches, between 3 and 45 percent of the fish at each sampling site exceeded the action level.

An initial data/statistical report was sent to Congress on June 12; a final interpretive report will be sent to Congress in December. Contact Stuart J. Wilk, FTS 342-8208 or (201) 872-0200.

"GHOST" GILL NET SURVEY COMPLETED

The third and final annual underwater survey of lost ("ghost") gill nets in the Stellwagen Bank-Jeffreys Ledge area found a single ghost net some 1,000 feet long on Stellwagen Bank. The survey, a cooperative effort among the Center, the Massachusetts Division of Marine Fisheries, and the National Undersea Research Program - University of Connecticut at Avery Point, included 10 dives during June 10-17 on five traditionally fished gill net sites on Stellwagen Bank using the research submersible *Delta* with support vessel *Atlantic Twin*.

The 1,000-foot net appeared to be recently lost and was actively fishing; the catch included many dogfish (fresh and decaying), several crab species (Jonah, rock, and spider), and lobsters. Hagfish were feeding on the dead fish. We also resurveyed, for the third year, two ghost nets on Jeffreys Ledge. Both nets were still fishing, but less effectively than in 1984 and 1985.

Perceived degradation of historically productive commercial and recreational fishing grounds by fleet gill netting, and suspected fishing by ghost gill nets, was the original impetus for the three-year survey. A final report of survey findings is being prepared for the New England Fishery Management Council. Contact Joseph R. Uzmann, FTS 840-1271 or (617) 548-5123.

ENVIRONMENTAL CONDITIONS SUMMARIZED FOR NORTHWEST ATLANTIC 1985

The Center has prepared four reports of environmental conditions in the Northwest Atlantic during 1985. The reports cover: (1) variation in the shelf-water front position from Georges Bank to Cape Romain; (2) water-column thermal structure across the shelf and slope southeast of Sandy Hook, New Jersey; (3) sea-surface temperatures in the Northwest Atlantic; and (4) anticyclonic warm-core Gulf Stream rings off the northeastern United States. Copies are available from Joyce Denecour, National Marine Fisheries Service, South Ferry Road, Narragansett, RI 02882. Contact Reed S. Armstrong, FTS 838-7138 or (401) 789-9326.

GAMBA PRAWN GENUS *PSEUDARISTEUS* REVISED

A monograph has been completed which revises the gamba prawn (shrimp) genus *Pseudaristeus*. This wide-ranging group of prawns includes six species with commercial potential, two of which were previously unknown to science, and another of which was previously known only in the juvenile stage. Contact Dr. Isabel C. Canet, FTS/(202) 357-2524.

"PROFILES" DEVELOPED FOR FLAVOR AND TEXTURE OF FLOUNDERS AND TUNA

As part of the Center's ongoing program to "profile" the edibility characteristics (i.e., flavor and texture) of seafood species, we have just completed profiles for four more species: winter flounder, yellowtail flounder, witch flounder, and yellowfin tuna. Such profiles are an effort to enhance the marketability of traditional seafood species, and to improve the marketability of less traditional seafood species, by emphasizing their table characteristics instead of their market names. Contact Joseph M. Mendelsohn, FTS 837-9282 or (617) 281-3600.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

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IN THIS ISSUE:

SHELLFISH DREDGING AND CULLING LESS HARMFUL THAN THOUGHT

CHECKLIST DRAFTED FOR NAMES OF DECAPOD CRUSTACEANS

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RECENT PUBLICATIONS, REPORTS, AND PRESENTATIONS

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National Oceanic and Atmospheric Administration
National Marine Fisheries Service
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SHELLFISH DREDGING AND CULLING LESS HARMFUL THAN THOUGHT

A recent undersea study by the Center suggests that dredging and culling of surf clams, ocean quahogs, and sea scallops cause less mortality to unharvested and discarded shellfish than previously thought. The study took place off New Jersey and Delaware at depths of 70-220 feet, and involved six vessels: the fishing vessels *Carolina Dawn* (scalloper), *John Marvin* (surf clammer), and *Shrewsbury* (ocean quahogger); the Center research vessel *Delaware II*; and the Harbor Branch Foundation's manned research submersible *Johnson-Sea-Link I* and its supporting research vessel *Edwin Link*.

The study's 16 dives during a 10-day period yielded 40 videotapes and 5,600 photographs of our first-ever undersea observations of the effects that dredging and culling have on mortality of offshore shellfish resources. A videotape which summarizes our findings is being prepared for viewing by the New England and Mid-Atlantic Fishery Management Councils, as well as the shellfish fishing industry. Contact Dr. Fredric M. Serchuk, FTS 840-1245 or (617) 548-5123.

CHECKLIST DRAFTED FOR NAMES OF DECAPOD CRUSTACEANS

A checklist of the names of the approximately 1,600 species of decapod crustaceans known to occur in fresh and marine waters of North America is nearing completion. Modeled on the American Fisheries Society's (AFS) *List of Common and Scientific Names of Fishes from the United States and Canada*, the crustacean list gives accepted scientific names with author and date of original description for each species, general distribution, and an accepted common name for many but not all species. Initiated by the AFS Committee on Common and Scientific Names of Aquatic Invertebrates, the list was actually drafted by a Committee of the Crustacean Society in collaboration with interested scientists. The list is intended for a special publication of AFS. General distribution is not possible at this time, but written queries concerning individual species will be considered. Contact Dr. Austin B. Williams, National Marine Fisheries Service, National Systematics Laboratory, U.S. National Museum of Natural History, Washington, D.C. 20560.

SHARKS, TUNAS, AND BILLFISHES SUBJECT OF COOPERATIVE CRUISE WITH POLISH SCIENTISTS

The possibility of a shark fishery management plan being developed by the Regional Fishery Management Councils has increased the importance of the Center's ongoing research into large pelagic fishes (sharks, tunas, and billfishes). A major cooperative cruise (Polish research vessel *Wieczno*) to study large pelagics, particularly sharks, began in late July, and will end in mid-September. The cruise will survey continental shelf and slope waters from Georges Bank to Miami, Florida, as well as Gulf Stream waters from Miami to about 300 miles northeast of Cape Hatteras, in order to gather data and samples to yield information on: (1) species composition; (2) geographic distribution; (3) migrations; (4) food and feeding habits; (5) growth rates; (6) age composition; (7) relative abundance; (8) parasites; and (9) vulnerability to various fishing gear. Contact John G. Casey, FTS 838-7138 or (401) 789-9326.

RECENT PUBLICATIONS, REPORTS, AND PRESENTATIONS

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Judith Brownlow

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts 02543

AUGUST 1986

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The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

STATUS-OF-THE-STOCKS REPORT

The Center has completed the report on "The Status of the Fishery Resources Off the Northeastern United States for 1986" and will issue it during November in the *NOAA Technical Memorandum NMFS-F/NEC* series. This status-of-the-stocks report is an annual update to a five-year-old series of such reports. The status of 34 species, or groups of species, is described in a series of 2-5 page writeups. Summaries of commercial/recreational catches and research vessel survey catches are presented in graphs and tables accompanying each writeup. Summaries of general economic and biological information on each species are presented in the introduction.

Some of the material for this report came from the Center's Stock Assessment Workshop (SAW) conducted in May. At this workshop, scientists from NMFS, regional fishery management councils, state marine fisheries agencies, and universities reviewed new and updated stock assessment information for 13 species, and produced a report which presented detailed assessment information. Another Stock Assessment Workshop is planned for the first week in September, during which assessment information for an additional 11 species of commercial/recreational value will be reviewed. Contact Dr. Tim D. Smith, FTS 840-1251 or (617) 548-5123.

COMMERCIAL FISHING DATA COLLECTION

The Center has completed installing IBM PC-XT microcomputer systems in major commercial fishing ports of NMFS's Northeast Region. These systems are now being used by the Center's port agents to enter and audit catch-effort and economic data collected in the ports. Audited data are transmitted to the Center's Woods Hole Laboratory on diskettes for inclusion in the Center's commercial fisheries data base.

Early results show marked improvement in data quality and decreased turnaround time between data collection and availability to users. Time saved will be devoted to increasing the number of interviews with vessel captains, enhancing biological sampling efforts, and improving the overall data collection program. Contact Ronnee L. Schultz, FTS 840-1264 or (617) 548-5123.

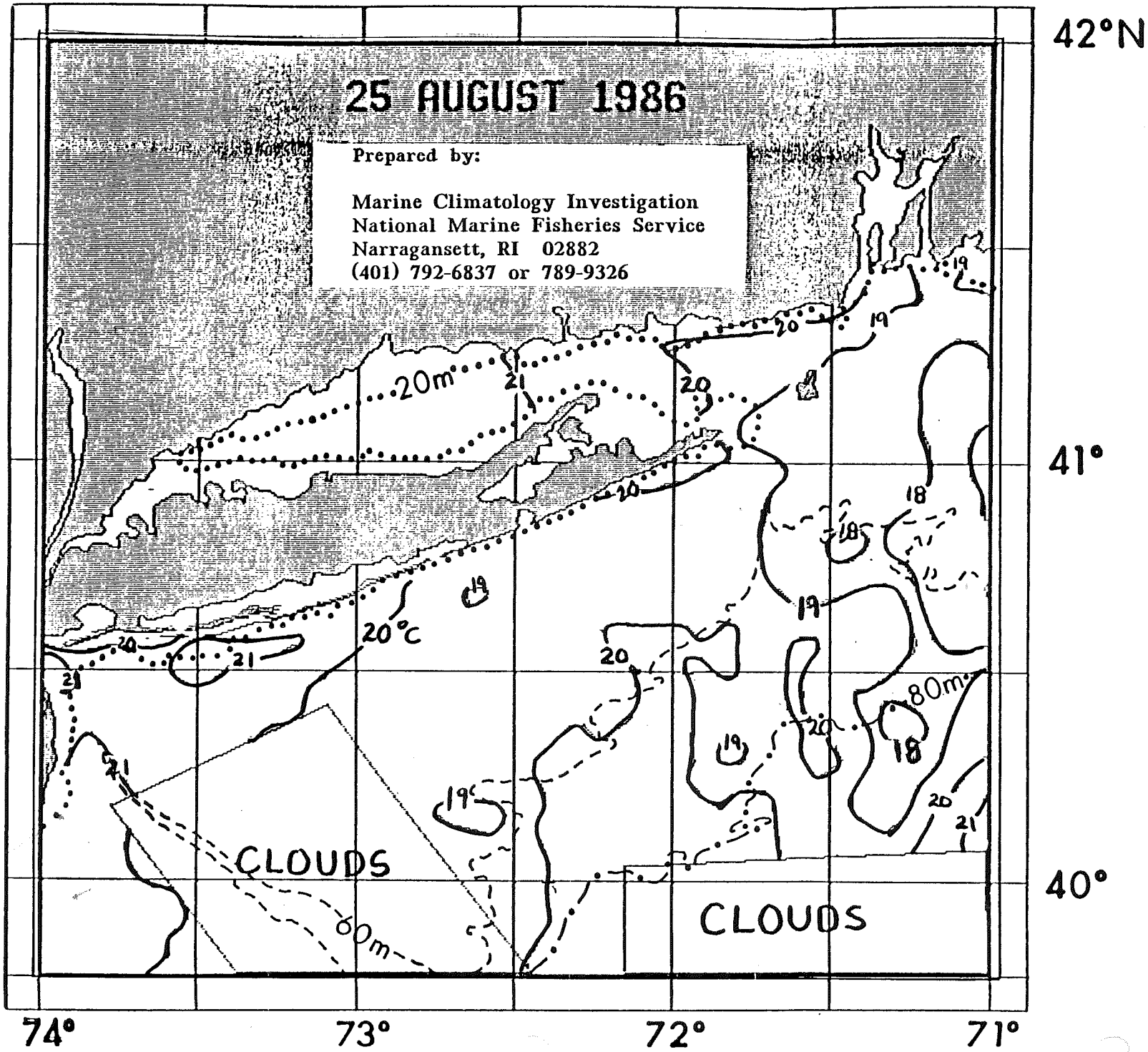
SHELF-WATER TEMPERATURE CHARTS

Infrared data from orbiting NOAA satellites are commonly used to produce near real-time charts of major frontal features such as the Gulf Stream, the shelf water - slope water front, and warm-core Gulf Stream rings in the slope-water mass. However, a similar set of near real-time charts of features or surface temperatures in the shelf-water mass is not routinely available on a scale useful to scientists or fishing interests operating in the coastal waters of the northeastern United States.

Accordingly, the Center has developed a prototype chart of near real-time sea-surface temperatures; a copy is attached for review and comment. If judged feasible, such charts would be produced weekly (cloud-free conditions permitting) and distributed to scientists in the Center; if a suitable distributional mechanism could be found, the charts would also be distributed to scientific and fisheries interests outside of the Center. Contact Carol A. Price, (401) 792-6837.

TEMPERATURE CONVERSIONS

°C	°F
27	80.6
26	78.8
25	77.0
24	75.2
23	73.4
22	71.6
21	69.8
20	68.0
19	66.2
18	64.4
17	62.6
16	60.8
15	59.0
14	57.2
13	55.4
12	53.6
11	51.8
10	50.0
9	48.2
8	46.4
7	44.6
6	42.8
5	41.0
4	39.2



ILLUSTRATED KEY TO COMMERCIAL AMERICAN PENAEOID SHRIMPS

The National Systematics Laboratory has completed an illustrated key to the commercial penaeoid shrimps of the Americas. Currently, it is difficult to identify some of the economically valuable species occurring in the western Atlantic and eastern Pacific. The key, which is based on readily recognizable characteristics, will improve the identification of the exploited species. Several of the characteristics used in the key became evident only during the course of this study. Four previously undescribed species were also discovered. Illustrations of the anatomical terms used in the key are presented on three plates, and 40 other plates depict the entire animal or the carapace together with the male (petasma) and the female (thelycum) genitalia. Contact Dr. Isabel C. Canet, FTS/(202) 357-1417.

12-MILE DUMPSITE MONITORING

The Center has completed the first round of sampling in a three-year study to monitor recovery of the 12-mile sewage sludge dumpsite off the New York - New Jersey coast. Disposal of sewage sludge at this site since 1924 has altered adversely the site's benthic habitats, as well as has affected its shellfish, finfish, and other marine resources. Gradual phaseout of the dumpsite began in April 1986, and will cease by December 1987.

The multidisciplinary study, incorporating physical, chemical, and biological measures, will provide data on distribution and abundance of finfish, shellfish, and forage species with related data on organic and heavy metal concentrations in sediments and tissues. Microbial contamination in shellfish will be monitored (with FDA support) to determine changes in areas acceptable for harvesting. Rates of change in chemical burdens and changes in community structure will be used to develop a model of resource recovery. Contact Dr. Robert A. Murchelano, FTS 840-1263 or (617) 548-5123.

NUTRITIONAL COMPOSITION OF 17 SEAFOOD SPECIES

The Center's nomenclature project is an ongoing study designed to categorize fish species by such sensory characteristics as flavor and texture. By showing that the sensory characteristics of certain species of fish are similar, then the more lightly marketed species can be more readily substituted for the more heavily marketed (and more commonly overfished) species.

As part of this project, the Center has analyzed 17 fish species local to the fishing port of Gloucester, Massachusetts, for proximate composition (i.e., protein, fat, ash, and moisture), cholesterol content, and fatty acid profiles (the latter being related to the study of the therapeutic effects of fish oils on human heart disease). Species analyzed are: Atlantic cod, silver hake (whiting), pollock, red hake (ling), haddock, redfish (ocean perch), goosefish (monkfish), Atlantic wolffish (ocean cat), skate, American plaice (dab), yellowtail flounder, witch flounder (grey sole), winter flounder (blackback flounder), Atlantic herring, Atlantic mackerel, bluefin tuna, and yellowfin tuna. Contact Judith Krzynowek, FTS 837-9226 or (617) 281-3600.

BOSTON SEAFOOD FESTIVAL

The Center participated in the Boston Seafood Festival held on July 27 and 28 on the Boston Fish Pier. Edible samples of 17 species of fresh local fish were displayed on the deck of NOAA research vessel *Albatross IV*. A large number of people attended despite the rainy weather, and showed genuine interest in the number of species available locally for good eating. Contact Robert J. Learson, FTS 837-9247 or (617) 281-3600.

RIGHT WHALE RESEARCH

The Center has signed a cooperative agreement with the University of Rhode Island (URI) to implement a Congressional initiative for research on the severely threatened North Atlantic right whale. Research will be conducted by a consortium of East Coast institutions, including URI's Graduate School of Oceanography, the New England Aquarium, the Provincetown Center for Coastal Studies, and the Woods Hole Oceanographic Institution. The research objectives are to: (1) develop indices for monitoring population changes; and (2) determine the causes for such changes.

To achieve these objectives, a fully integrated research program for North Atlantic right whales will be conducted. Designs for research tasks and plans for shipboard and aerial surveys are being developed. Data will be collected on behavior patterns, respiration rates, habitat usage, microscale movements, residence times, surface feeding, social groupings, and reproductive rates. The data will be incorporated into a standardized data base which began in 1956. Contact Gordon T. Waring, FTS 840-1311 or (617) 548-5123.

Judy Brownlow

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts 02543

SEPTEMBER 1986

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NATIONAL SYSTEMATICS LABORATORY'S SHRIMP BIOLOGIST RETIRES

The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

COD STOCKS DECLINE AS FISHING MORTALITY REACHES RECORD HIGH

Atlantic cod stocks off the northeastern United States have declined to historically low levels of abundance. Up-to-date assessments of both the Georges Bank and Gulf of Maine cod stocks were recently presented and peer-reviewed at the Center's third stock assessment workshop held during September 6-12 in Woods Hole. For the Georges Bank cod stock, workshop participants concluded that the biomass of the spawning stock had declined by 50 percent between 1978 and 1985; and fishing mortality had doubled, reaching a record high level in 1985. For the Gulf of Maine cod stock, the consensus was that the stock was in poor condition since various abundance measures (commercial catch rates, research vessel survey indices, and other indicators) were all at historically low levels.

For both stocks, the workshop participants felt that "growth" overfishing (catching fish at such a young age/small size that there will be a loss in the harvestable biomass due to the unrealized growth in the young/small fish) was occurring and that, given present trends, "recruitment" overfishing (catching fish at such a heavy rate that there won't be enough spawners left to replace themselves) was a possibility. Contact Dr. Fredric M. Serchuk, FTS 840-1245 or (617) 548-5123.

SEA SCALLOP SURVEY SHOWS A RECOVERY IN ABUNDANCE

The Center conducted the 1986 survey of the Georges Bank and Mid-Atlantic sea scallop resources during July 29 - August 29, using the NOAA research vessel *Albatross IV*. Survey results indicate that the marked improvement in sea scallop abundance that began in 1985 has continued. Resource recovery from the record low 1983-84 condition has occurred due to widespread outstanding recruitment of the 1982 and 1983 year classes. In the U.S. portion of Georges Bank, the 1986 survey abundance values were among the highest in the 12-year series of annual surveys. Current abundance levels in both resource areas are three-to-four-fold greater than during 1983-84.

A report summarizing the 1986 survey data is available. Contact Dr. Fredric M. Serchuk, FTS 840-1245 or (617) 548-5123.

NORTHERN SHRIMP SURVEY YIELDS A OUTLOOK

The fourth annual Gulf of Maine northern shrimp survey was completed in August aboard the Center's research vessel *Gloria Michelle*. Catches were highest off the south-central Maine coast; abundance dropped sharply east of Penobscot Bay. Abundance and biomass levels were comparable to those observed last year. Catches contained a relatively high proportion of what were assumed to be (based on size distribution) age 4 (or 1982-year-class) shrimp. These observations suggest that the 1986-87 shrimp season will be rather good in terms of both resource availability and product quality.

As in former years, the survey has been performed on a cooperative basis by personnel from the Maine Department of Marine Resources, the New Hampshire Fish and Game Department, the Massachusetts Division of Marine Fisheries, and the Center. Contact Dr. Stephen H. Clark, FTS 840-1312 or (617) 548-5123.

MAJOR LONGLINE SURVEY COMPLETED FOR APEX PREDATORS

The Center has completed a major longline survey of apex predators, primarily large sharks, in the Middle Atlantic and South Atlantic Bights. The survey cooperatively used the Polish research vessel *Wieczno* as the sampling platform, occurred from July 31 to September 17, and covered the 20-1,000-meter depth range.

We captured 679 fish representing 32 species (17 of them sharks). The most common large shark species were sandbar and Atlantic sharpnose; the most common large nonshark species were swordfish and yellowfin tuna. Shark species which occur inshore (e.g., sandbar, bull, lemon, nurse, sandtiger, and blacktip) were not adequately sampled since the survey began at the 20-meter depth contour. Inshore surveys will be needed to complement our offshore surveys before comprehensive evaluations of shark populations can be made.

A key focus of the survey was to compare the effectiveness and efficiency of various types of longline gear and baits for the various species of apex predators. The small number of longline sets (from a statistical standpoint) makes the results inconclusive, but it appears that: (1) there was no significant difference in catch rates between "swordfish" gear and "tuna" gear; and (2) there was a higher catch rate using mackerel instead of squid as bait. A summary report of survey results is available. Contact John G. Casey, FTS 838-7142 or (401) 789-9326.

STUDY UNDERWAY ON HABITAT RECOVERY AT 12-MILE DUMPSITE

The first rounds of sampling habitats in the environs of the 12-mile sludge dumping area off New York Harbor have been completed. The purpose of this new study is to document change in chemistry and biota resulting from the closure of this nearshore sludge dumping area. The sampling plan includes broadscale and repetitive components to reliably characterize habitat, benthic biota, and bottom fish communities.

Fish samples were examined for size and biomass estimates. Subsamples of winter flounder, red hake, and American lobsters were examined for diet items, and winter flounder were tagged and released. In general, invertebrates, mainly rock crabs, have dominated the catches. Groundfish (flounders and hake) were in low abundance, and, as expected, spotty catches were made of squid and butterfish.

A coordinating meeting was held in Milford, Connecticut, to develop plans and protocols for pathology observations and the collection of samples for organic analyses. Contact Anne L. Studholme, FTS 342-8201 or (201) 872-0200.

STOCK ASSESSMENT WORKSHOP HELD

The Center held its third stock assessment workshop (SAW) during early September. These workshops, held on a semiannual basis, provide a forum for the collaboration of scientists from state and federal agencies, the regional fishery management councils, the Atlantic States Marine Fisheries Commission (ASMFC), and academia in the assessment of fishery stocks off the northeastern United States. Discussions related to individual stock assessments provide the New England and Mid-Atlantic Fishery Management Councils and the ASMFC with scientific advice needed in their management processes. In addition, these workshops provide an arena for discussions of ongoing and proposed research projects relative to many generic fisheries issues.

During the third SAW, updated stock assessments were reviewed for surf clams, ocean quahogs, summer flounder, American lobster, winter flounder, bluefish, Atlantic cod, pollock, and northern shrimp resources. Research needs for the assessment of weakfish were also discussed. Special discussion topics included working group reports on trawl survey design, bluefish aging research needs, methods of measuring long-term potential catch, and changes in catchability. Contact Anne M.T. Lange, FTS 840-1301 or (617) 548-5123.

REVISION UNDERWAY FOR *FISHES OF THE GULF MAINE*

Henry Bigelow and William Schroeder's classic book on the *Fishes of the Gulf of Maine* will be updated and revised. Bigelow and Schroeder's work, which was published in 1953 as part of the *Fishery Bulletin* series, was itself a revision of an earlier work by Bigelow and William Welsh in 1925. The 1953 book is still a useful reference for fishery researchers, managers, and instructors, as well as commercial and recreational fishermen operating in the Gulf of Maine. Harvard University's Museum of Comparative Zoology continues to reprint and sell the 1953 edition.

In the past 34 years, though, many changes have occurred in the scientific and common names of Gulf of Maine fishes, and much new information has also been developed on these fishes' early life history and food habits. A considerable amount of this new information may well be contained in unpublished manuscripts and data files. Those familiar with Bigelow and Schroeder's 1953 work who have such new information are encouraged to contact Dr. Bruce B. Collette, Director of NMFS's National Systematics Laboratory, at (202) 357-2524. Dr. Collette and Dr. Grace Klein MacPhee, who is associated with the University of Rhode Island, will undertake the revision. Drs. Collette and MacPhee will also update the fisheries information in addition to the biological information in the book.

NATIONAL SYSTEMATICS LABORATORY'S SHRIMP BIOLOGIST RETIRES

Dr. Isabel C. Canet (Perez Farfante) retired after more than 45 years as a marine biologist, the last 20 years with the National Systematics Laboratory. Born in Cuba, educated at Havana and Radcliffe (where she received her doctorate), she taught in Cuba, authored a textbook, and became Director of the Cuban Fisheries Research Center -- "Centro de Investicagiones Pesqueras." She, her husband, and two sons left other family and Cuba for the United States after the revolution went communistic in 1960. As a leading world authority on shrimps, Dr. Canet published over 70 scientific papers, two of which were nominated for the *Fishery Bulletin's* "Best Publication" award. Although officially retiring from government service, she will continue her research in emeritus status with the National Systematics Laboratory, and as a research associate of the Smithsonian Institution. Dr. Canet is presently working on a key and list of genera and subgenera of the world penaeoid and sergestoid shrimps. Contact Dr. Bruce B. Collette, FTS/(202) 357-2524.

Judith Brownlow

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
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OCTOBER 1986

IN THIS ISSUE:

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center

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NORTHERN SHRIMP STOCK REMAINS STRONG

A recent assessment of the Gulf of Maine shrimp stock by state and Center scientists serving on the Atlantic States Marine Fisheries Commission's (ASMFC) Northern Shrimp Technical Committee indicates that the resource picture for the coming season is good. Analysis of summer survey data collected aboard the Center's research vessel *Gloria Michelle* has revealed that stock biomass is comparable to levels observed last year and that substantial numbers of large shrimp from the 1982 year class will be available to the 1986-87 winter fishery.

Accordingly, the Northern Shrimp Section of the ASMFC has established a December 1 - May 31 season for 1986-87, the maximum allowable (six months) under current ASMFC management policy. Prospects for future seasons appear more problematic, as subsequent year classes appear weaker. Contact Dr. Stephen H. Clark, FTS 840-1312 or (617) 548-5123.

ATLANTIC SALMON SAMPLED IN CANADIAN AND GREENLAND COMMERCIAL FISHERIES

American scientists from Maine's Atlantic Sea-Run Salmon Commission and from the Center were sent to Canada and Greenland this past summer to collect data on the salmon fisheries of Labrador and West Greenland. Since these fisheries intercept salmon of both North American and European origin, visiting scientists were granted permission not only to collect biological data, but also to recover tags from the commercial catch in order to determine the country of origin of the individual fish in the catch.

For the study of stock composition and the estimation of the harvest of U.S. salmon in these fisheries, smolts from U.S. hatcheries are now being marked with coded-wire tags prior to their seaward migration. The tags are subsequently detected in adult salmon with a magnetic sensor, then removed from the fish for interpretation. They contain information on the country, river, and hatchery of origin, which is remarkable considering they are less than one-millimeter long. Tags are recaptured beginning one year after smolt release, thus sampling efforts this past summer were able to recover tags implanted in the 1985 smolt class. Sampling next summer will be to recover tags in the 1986 smolt class and the 1985 tags still at large. Contact Dr. Kevin Friedland, FTS 840-1335 or (617) 548-5123.

INFECTIOUS SARCOMA DISEASE DROPS OFF, BOUNCES BACK IN CHESAPEAKE BAY SOFTSHELL CLAMS

The spring 1986 survey of representative populations of softshell clams from 13 key sites in Chesapeake Bay indicated that the prevalence of infectious sarcoma disease was generally very low (less than 10 percent) compared to the previous year. Our monthly samples from Swan Point (the most severely affected site) had similarly low prevalences until last month (September 1986), though, when 42 percent of the clams had early and intermediate stage sarcomas. These findings suggest a resurgence of the disease and that softshell clam fishermen in Chesapeake Bay may again encounter a scarcity of clams this coming winter. Contact Austin C. Farley, (301) 226-5193.

HIGH INCIDENCE OF HAIRS AND FIBERS IN NEW YORK BIGHT LOBSTERS

The Center is attempting to document changes in fishery resources and their habitats as dumping is phased out at the 12-mile sewage sludge dumpsite in the New York Bight. Part of the project involves analyzing the food habits of key finfish species (winter flounder and red & silver hake) and American lobsters from the area of greatest sludge accumulation, as well as from refence stations to the north and south.

In the first three months of sampling (July-September 1986), at least 50 percent of the lobsters collected from each of the three areas had hairs and fibers (both cloth and metal) wrapped around the gastric teeth or in balls in their stomachs. Most of the hairs and fibers are presumably from sludge dumping, although other human inputs could be contributing. We do not yet know whether the lobsters' health is being affected. Our monitoring of the incidence of hairs and fibers will provide one indication of any reduction in sludge in lobster habitats as abatement proceeds. Contact Frank W. Steimle, Jr., FTS 342-8259 or (201) 872-0200.

NARRAGANSETT BAY'S HARD CLAMS EXAMINED FOR HISTOPATHOLOGY

On October 2, we forwarded a progress report to EPA on our histopathological examination of Narragansett Bay's hard clams. With the exception of those clams that were observed during gross examination as "gapers," the majority of the clams showed little in the way of health threatening pathology. Most of the histopathology found was associated with the stress of spawning. Two clams were diagnosed with a neoplastic lesion. Preparation of the final report is in progress. Contact Dr. Aaron Rosenfield, (301) 226-5193.

STONE CRAB DIVIDED INTO TWO SPECIES

The stone crab, known until now as *Menippe mercenaria* in the Caribbean and Carolinian provinces of the western North Atlantic, is divisible into two morphologically distinct populations with almost separate, narrowly overlapping ranges. These populations have now been recognized as distinct species by A. B. Williams and D. L. Felder. (See the "Recent Publications, Reports, and Presentations" section of this newsletter.)

The species differ in color, carapace morphometry, and stidulatory patches on chelae of the chelipeds. *Menippe mercenaria*, the Florida stone crab, ranges from Cape Lookout, North Carolina, through peninsular Florida, the Bahamas, and the Greater Antilles, to the Yucatan peninsula, Mexico, and Belize. *Menippe adina*, the Gulf stone crab, ranges from northwestern Florida around the Gulf of Mexico to Tamaulipas State, Mexico. The two species hybridize in the Apalachee Bay region of northwestern Florida. Contact Dr. Austin B. Williams, FTS/(202) 357-2639.

REMOTE SENSING VEHICLE OBTAINS VIDEOTAPES OF NEW YORK BIGHT DUMP AREAS

In a collaborative study with Queens College of the City University of New York, the Explorers Club, and representatives of private industry, the Center used a low-cost remotely operated vehicle (LCROV) to obtain videotapes of the sediment-water interface at: (1) the New York Bight cellar-dirt dredge dumpsite; (2) the 12-mile sewage sludge dumpsite; and (3) the Christiaensen Basin, the latter being a depositional area which receives input from the dredge-spoil and sewage-sludge dumpsites. The study showed the effectiveness of using an LCROV for ecological monitoring, especially in areas such as the cellar-dirt dumpsite where building rubble precludes more traditional sampling techniques.

The almost two-and-one-half hours of videotape showed: (1) an artificial-reef-type live bottom with several species of fish at the cellar-dirt dumpsite; (2) sand ripples and a burrowing anemone community at the lightly used northeast corner of the sewage-sludge dumpsite; and (3) soft black muds with extensive tubeworms (*Glycera* spp.) and white bacterial mats (probably *Beggiatoa* spp.) in the Christiaensen Basin. Contact William C. Phoel, FTS 342-8215 or (201) 872-0200.

INSTRUCTING ITALY IN BIVALVE MOLLUSK AGING TECHNIQUES

Scientists from the Instituto di Ricerche Sulla Pesca Marittima in Ancona, Italy, visited the Center during October 20-31 to consult with Center scientists on aging techniques. Although problems with aging several finfish species from the Adriatic and Mediterranean Seas were discussed, the major point of interest was our method for preparing bivalve mollusk species for age determinations. Contact John W. Ropes, FTS 840-1287 or (617) 548-5123.

CENTER ASSISTS SMALL BUSINESS ADMINISTRATION ON RECENT RED-TIDE BLOOM IN TEXAS

The Center recently assisted the Disaster Division of the Small Business Administration (SBA) with information on the nature of the red tide currently causing fish kills in the Gulf of Mexico. The Governor of Texas has inquired of the SBA about disaster relief for businesses in his state that suffered as a result of the red tide, and the SBA must make a technical decision on the basic classification of a red-tide occurrence. Contact John B. Mahoney, FTS 342-8255 or (201) 872-0200.

PARASITIC ISOPOD NAMED FOR CENTER BIOLOGIST

Dr. Bruce B. Collette, National Systematics Laboratory Director, was honored by having a new species of parasitic isopod named after him. The isopod was described by Dr. Niel L. Bruce in the *Journal of Natural History*, volume 20, pages 1089-1192. The isopod, *Mothocya collettei*, was part of a large collection of isopods removed from the gills and oral cavities of needlefishes and halfbeaks as they were studied by Dr. Collette. Contact Dr. Austin B. Williams, FTS/(202) 357-2639.

16TH ANNUAL OPEN HOUSE HELD AT SANDY HOOK LABORATORY

The Center's Sandy Hook Laboratory in Highlands, New Jersey, held its 16th annual open house on Friday, October 10. Exhibits were on display throughout the building and research activities were discussed. Research topics focused on studies of commercial and recreational fisheries in the Mid-Atlantic area. Other marine-oriented organizations participating in the event included: New Jersey Marine Sciences Consortium; American Littoral Society; U.S. Coast Guard; Marine Academy of Science and Technology; Gateway National Recreation Area; New Jersey Department of Environmental Protection; U.S. Environmental Protection Agency; and a representative from the Fulton Fish Market, New York. A videotape showing the recent exploration of the *Titanic*, provided by the Woods Hole Oceanographic Institution, was also shown. Contact Cathy Noonan, FTS 342-8205 or (201) 872-0200.

RECENT PUBLICATIONS, REPORTS, AND PRESENTATIONS

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JOHNSON, P.T. 1986. Parasites of benthic amphipods: dinoflagellates (Duboscquodinia: Syndinidae). Fish. Bull., U.S. 84:605-614.

PEREZ FARFANTE, I., and B.B. Boothe, Jr. 1986. Redescription and range extension of the shrimp *Parapenaeopsis balli* (Decapoda: Penaeidae). J. Crustacean Biol. 6(3):401-407.

ROPES, J.W. 1986. Measuring the age of ocean quahogs. Maritimes 30(3):8-10.

WILLIAMS, A.B., and D.L. Felder. 1986. Analysis of stone crabs: *Menippe mercenaria* (Say), restricted, and previously unrecognized species described (Decapoda: Xanthidae). Proc. Biol. Soc. Wash. 99(3):517-543.

WILLIAMS, A.B., and P.A. Rona. 1986. Two new caridean shrimps (Bresiliidae) from a hydrothermal field on the Mid-Atlantic Ridge. J. Crustacean Biol. 6(3):446-462.

WILLIAMS, A.B., and R.D. Turner. 1986. Squat lobsters (Galatheidae: *Munidopsis*) associated with mesh-enclosed wood panels submerged in the deep sea. J. Crustacean Biol. 6(3): 617-624.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts 02543

NOVEMBER 1986

IN THIS ISSUE:

FISHERMEN'S REPORT AVAILABLE FOR 1986 AUTUMN BOTTOM TRAWL SURVEY

LARGE 1985 YEAR CLASS OF GEORGES BANK COD CONFIRMED

NATIONAL SYSTEMATICS LABORATORY UNDERTAKES RESEARCH ON CORAL TAXONOMY

NEW FOREIGN FISHERIES OBSERVERS TRAINED

LARGE SEAWARD MOVEMENT OF SHELF WATER IN GEORGES BANK REGION

The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

FISHERMEN'S REPORT AVAILABLE FOR 1986 AUTUMN BOTTOM TRAWL SURVEY

A *Fishermen's Report*, based on the Center's 1986 autumn bottom trawl survey, is available free of charge for the asking. The report lists the composition and size of catches of 23 commercially and recreationally important species at 360 sites between Nova Scotia and North Carolina. The report also includes information on the exact location (Loran C and latitude/longitude), water depth, and bottom temperature of the sampling sites.

This autumn's survey was conducted September 14 - November 7 aboard the NOAA research vessels *Albatross IV* and *Delaware II*. Catches in many areas, particularly the Southwest and Cultivator Shoals areas of Georges Bank, were lighter than in previous years. Contact Linda Despres-Patanjo, FTS 840-1346 or (617) 548-5123.

LARGE 1985 YEAR CLASS OF GEORGES BANK COD CONFIRMED

The Center's 1986 autumn bottom trawl survey has confirmed a large 1985 year class of Atlantic cod on Georges Bank. The survey showed the highest number of one-year-old cod (the 1985 year class) since 1981, and the fifth highest number in the 24 years of these autumn surveys. Consequently, scrod cod abundance will increase significantly on Georges Bank during 1987. Also, preliminary analysis of the survey data suggests that the 1985 year class of Georges Bank haddock may be smaller than indicated by earlier survey data. Contact Dr. Fredric M. Serchuk, FTS 840-1245 or (617) 548-5123.

NATIONAL SYSTEMATICS LABORATORY UNDERTAKES RESEARCH ON CORAL TAXONOMY

The National Systematics Laboratory has begun research to clarify the taxonomy of the Caribbean and Atlantic species of *Porites* corals. *Porites* corals are among the most abundant and widely distributed reef-building corals in the world, and play a major role in the development and occurrence of coral-reef fish communities. Contact Lt. Stephen C. Jameson, FTS/(202) 357-2486.

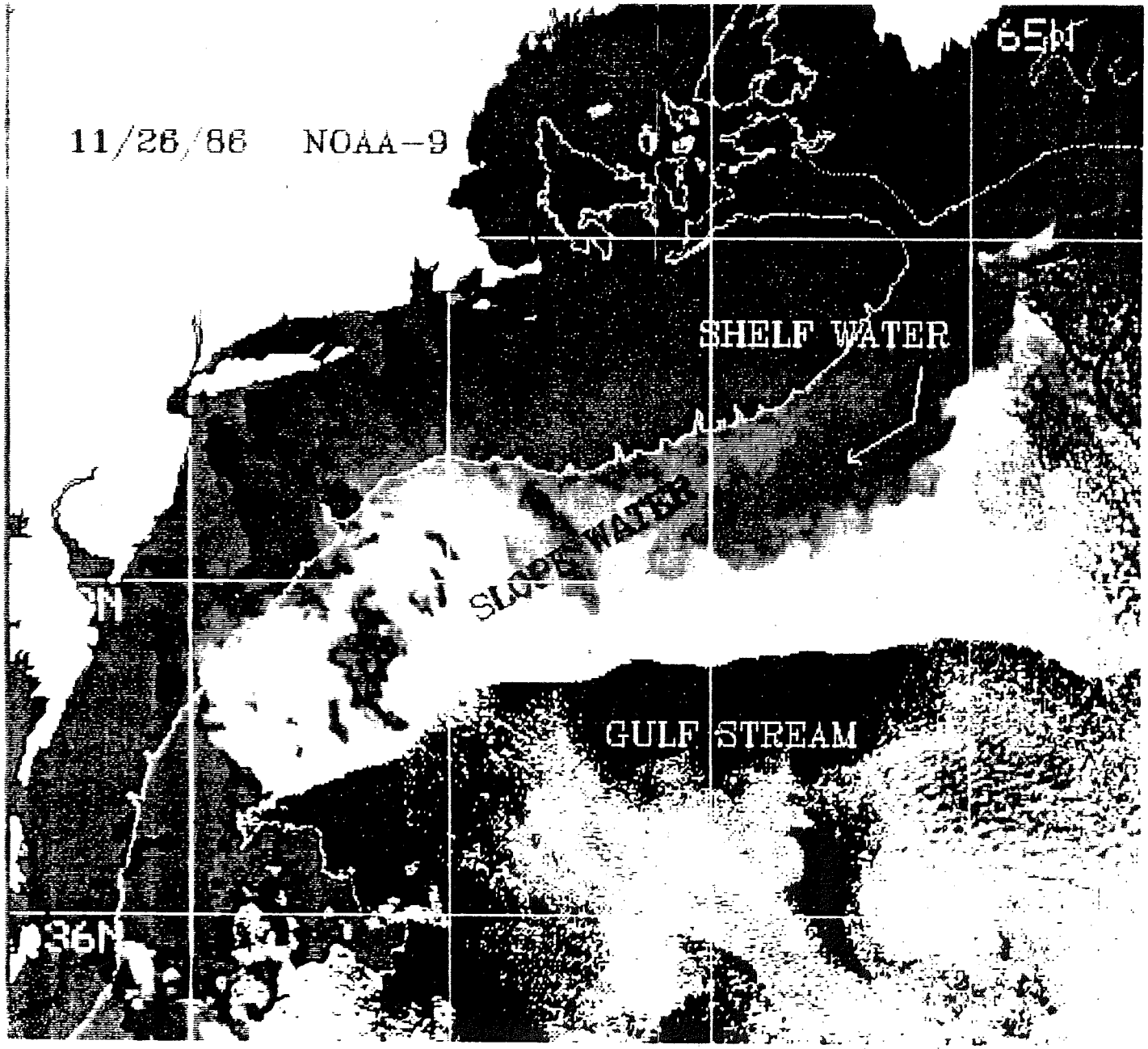
NEW FOREIGN FISHERIES OBSERVERS TRAINED

During November 3-14 at the Center's Woods Hole Laboratory, Center scientists assisted in the training of nine new foreign fisheries observers who will soon be on board foreign vessels to monitor their fishing activities off the New England and Mid-Atlantic states. The U.S. Coast Guard, U.S. Navy, and other elements of NOAA assisted in the training.

The Center's efforts focused on the identification of species, the theory of sampling, and the techniques of collecting biological samples (scales, otoliths, etc.). Good samples from foreign fisheries are needed to assure sound assessments of several of the region's fish stocks. Contact Anne M.T. Lange, FTS 840-1301 or (617) 548-5123.

LARGE SEAWARD MOVEMENT OF SHELF WATER IN GEORGES BANK REGION

During November, a large parcel of cool continental shelf water moved seaward more than 80 nautical miles into the warmer continental slope waters between the Northeast Channel and Corsair Canyon along the eastern end of Georges Bank. The attached satellite image taken on November 26 shows the shelf water extension. The causes of this oceanographic event, as well as any ecological effects it may produce, cannot yet be determined, but its size can be. The extension occupies 14,000 square nautical miles, which compares favorably to the size of all of Georges Bank (inside the 100-meter depth contour) at 15,400 square nautical miles! Contact Lt. j.g. Kenneth Barton, (401) 792-6837.


11/26/86 NOAA-9
65N
SHELF WATER
SLOPE WATER
GULF STREAM
36N

Judith Brownlow

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
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Woods Hole, Massachusetts 02543

DECEMBER 1986

IN THIS ISSUE:

PLANS FOR STUDYING RECOVERY OF 12-MILE DUMPSITE COMPLETED

NATIONAL SYSTEMATICS LABORATORY BEGINS SQUID RESEARCH

COPEPOD PARASITISM OF LARVAL AND JUVENILE FISH DOCUMENTED

OYSTER DIE-OFFS IN MASSACHUSETTS AND GEORGIA INVESTIGATED

The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

PLANS FOR STUDYING RECOVERY OF 12-MILE DUMPSITE COMPLETED

The Center has completed its plans for the study of the recovery of the New York Bight's 12-Mile Dumpsite. The dumpsite, the major site for sewage sludge disposal from New York City, will cease receiving sludge in December 1987. To see if and how this site's fisheries resources and habitats respond to the dumping phaseout, the Center will sample 27 sites--covering all habitat types--each month until at least a year after the dumping stops. Data will be gathered on distribution, abundance, food habits, gross disease, small and medium-sized bottom-dwelling animals, organic contaminant levels in various animals, water movements, water chemistry, and sediment chemistry. Collaborating groups include Brookhaven National Laboratory, U.S. Environmental Protection Agency, University of Delaware, Food and Drug Administration, and other elements of the National Marine Fisheries Service. Contact Anne L. Studholme or Robert N. Reid, FTS 342-8200 or (201) 872-0200.

NATIONAL SYSTEMATICS LABORATORY BEGINS SQUID RESEARCH

The National Systematics Laboratory has undertaken a three-part study of cephalopods, particularly squids: (1) a worldwide revision of the family Loliginidae which includes the Northeast's commercially valuable long-finned squid; (2) a reexamination of the genus *Illex* which includes the Northeast's commercially valuable short-finned squid and which is currently considered to have several closely related species that are hard to tell apart; and (3) the taxonomy and distribution of paralarval cephalopods to yield information on the little known early life history of these animals. Contact Dr. Bruce B. Collette, FTS/(202) 357-2524.

COPEPOD PARASITISM OF LARVAL AND JUVENIVE FISH DOCUMENTED

Little is known of the nature and extent of parasitism in general, and copepod parasitism in specific, for larval and juvenile marine fishes. Consequently, during the Center's June 1986 juvenile fish survey of Georges Bank, we examined several hundred specimens of larval and juvenile groundfish for visible external parasites. We found that over 97 percent of the Atlantic cod and 95 percent of the haddock were infested with the parasitic stage of the copepod *Caligus elongatus*. The average number of copepods on an individual haddock was 13.1; on cod it was 11.5.

Later laboratory examination showed that the filaments used by the parasitic copepods to anchor themselves to the fish did create sores in the skin, muscle, and connective tissue, may have affected such physiological functions as swimming, and may have offered a route for pathogens to enter the body. More study will be needed to determine the role of such parasites in the survival, growth, and recruitment of larval and juvenile fish. Contact Dr. Aaron Rosenfield, (301) 226-5193.

OYSTER DIE-OFFS IN MASSACHUSETTS AND GEORGIA INVESTIGATED

The Center has examined samples of American oysters from Massachusetts and Georgia to determine the cause of recent die-offs in those states' coastal waters. The cause of the Massachusetts die-off was not immediately apparent. The cause of the Georgia die-off was due, at least in part, to a severe infection by the oyster pathogen *Perkinsis marinus* ("Dermo"). Ninety-six percent of the Georgia oysters had Dermo infections. Contact Dr. Aaron Rosenfield, (301) 226-5193.

Judith Broadlow

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
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Woods Hole, Massachusetts 02543

JANUARY 1987

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WINTER FLOUNDER BEING TAGGED TO AID DUMPSITE STUDY

ITALY DETECTS CADMIUM IN IMPORTED SQUID; MAY AFFECT U.S. EXPORT MARKET

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The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center

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WINTER FLOUNDER BEING TAGGED TO AID DUMPSITE STUDY

More than 400 winter flounder have been tagged by Center scientists and released in the New York Bight. More will be tagged in coming months. Tag returns from cooperating fishermen should yield data on the movements and migrations of these bottom-dwelling fish within and around the bight's 12-Mile Dumpsite which is being phased out as New York City's major site for sewage sludge disposal. None of the one-half-inch-diameter yellow plastic disc tags have been returned yet. A news release encouraging tag returns was issued to pertinent news media in the New York - New Jersey area on January 9.

The Center's overall study of the recovery of the dumpsite has completed six months of sampling. Many more months of sampling will be needed to detect any significant changes in the fisheries resources and/or habitats of the dumpsite area. Contact Beth Valdes, FTS 342-8279 or (201) 872-0200.

ITALY DETECTS CADMIUM IN IMPORTED SQUID; MAY AFFECT U.S. EXPORT MARKET

The Italian government has detected what it feels are unhealthy levels of the toxic heavy metal cadmium in some of its imported long-finned (*Loligo*) and short-finned (*Illex*) squid. Although the cadmium levels in the edible portions of these squid don't exceed the Italian government's 2.0 mg/kg "action" level, the levels in the inedible portions (i.e., viscera) do. Because of apparent concern over the use of squid viscera in fish meal and similar products, and over the possible contamination of edible portions by the viscera, the Italian government has recommended limited import and sale of squid.

The Italian actions may or may not affect--particularly in our Northeast Region--the U.S. squid export market in Italy. For one thing, the Italian reports don't say where the imported squid that they tested had come from. Second, the reports didn't say if the test values were based on "wet" weight or "dry" weight, although they were probably the former.

Anyway, the Center has checked two samples of *Loligo* for cadmium. The first sample came from coastal New Jersey during October 1986. Dry weight cadmium values were: mantles - 0.75 mg/kg, tentacles - 1.00, and viscera - 5.25. The second sample came from coastal Massachusetts during December 1986. Dry weight values were: mantles - 0.375 mg/kg, tentacles - 0.4, and viscera - 1.2. Since dry weights would need to be reduced about 80 percent to be comparable with wet weight, it appears--*assuming the Italians used wet weight in their values*--that the Northeast's squid would have cadmium levels well below the Italian government's action level. Contact Elinor M. Ravesi, FTS 837-9287 or (617) 281-3600.

REPORT BEING PREPARED ON NEW JERSEY'S COASTAL WATER QUALITY

The Center, the New Jersey Department of Environmental Protection, the Delaware River Basin Commission, the Interstate Sanitation Commission, industry, and academia are participating on a panel to develop a report on the quality of New Jersey's coastal waters. The report will separate the state's coastal waters into three regions: Hudson-Raritan, Atlantic coastal, and Delaware River/Bay. Topics covered will include: water-column temperatures; sediments; physical habitat modifications; debris & other aesthetic problems; dissolved oxygen; water-column chemical contaminants; hazardous material spills; animal & plant life; water-column pathogens; algae blooms; contaminant effects on animal and plant life; human health risks from contact, recreation,

& seafood consumption; and demographic trends. The Center's main contribution will be information on contaminant concentrations & effects, dissolved oxygen, nutrients, and blooms. The panel hopes to produce a draft report by summer 1987. Contact Robert N. Reid, FTS 342-8220 or (201) 872-0200.

NATIONAL SYSTEMATICS LABORATORY AUTHORS GARNER PUBLICATION AWARDS

Two National Systematics Laboratory authors have received awards from the National Marine Fisheries Service for their scientific publications. Dr. Bruce B. Collette received the "Best Paper" award for the 1984 volume of the *Fishery Bulletin*. His publication, co-authored with J. L. Russo, dealt with "Morphology, Systematics, and Biology of the Spanish Mackerels (*Scomberomorus*, Scombridae)." Dr. Isabel Perez Farfante received "Honorable Mention" for the 1985 volume of the *Fishery Bulletin*. Her publication dealt with "The Rock Shrimp Genus *Sicyonia* (Crustacea: Decapoda: Penaeoidea) in the Eastern Pacific." Contact Dr. John B. Pearce, FTS 840-1261 or (617) 548-5123.

RECENT PUBLICATIONS, REPORTS, AND PRESENTATIONS

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FARLEY, C.A. 1986. Review *of* G. Lauckner and O. Kinne, eds. Introduction, Bivalvia to Scaphopoda. Pages 467-1038 *in* Diseases of marine animals, vol. 2. J. Wildl. Dis. 22:608-609.

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MAYO, R.K. 1986. Recent exploitation patterns and future stock rebuilding strategies for Acadian redfish, *Sebastes fasciatus* Storer, in the Gulf of Maine - Georges Bank region of the Northwest Atlantic. Paper presented *at* Fifth Annu. Lowell Wakefield Fish. Symp.; Anchorage, Alas.; Oct. 20-22, 1986. (Abstr.)

MURCHELANO, R.A., L.I. DESPRES-PATANJO, and J.J. ZISKOWSKI. 1986. A histopathologic evaluation of gross lesions excised from commercially important North Atlantic marine fishes. NOAA Tech. Rep. NMFS-37:1-14.

ROPES, J.W., and A. JEARLD, JR. 1987. Age determination of ocean bivalves. Pages 517-526 *in* R.C. Summerfelt and G.E. Hall, eds. Age and growth of fish. Iowa State University Press, Ames, Ia.

ZDANOWICZ, V.S., D.F. GADBOIS, and M.W. NEWMAN. 1986. Levels of organic and inorganic contaminants in sediments and fish tissues and prevalences of pathological disorders in winter flounder from estuaries of the northeast United States, 1984. Proc. Oceans '86 Conf. 578-585.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

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FEBRUARY 1987

IN THIS ISSUE:

STRIPED BASS PRODUCTION STILL LAGGING

YELLOWTAIL FLOUNDER LANDINGS INCREASE

VARIATION IN WINTER FLOUNDER REPRODUCTIVE EFFICIENCY

SIX NEW EDIBILITY PROFILES FOR NORTHEAST FISHES

INTERACTION OF HEAVY-METAL CONTAMINANTS IN SEA SCALLOPS

FISH EYE LESIONS AS INDICATORS OF ENVIRONMENTAL CONTAMINATION

The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

STRIPED BASS PRODUCTION STILL LAGGING

Abundance indices for juvenile striped bass during 1986 decreased in Albemarle Sound and increased in the Hudson River and the Maryland and Virginia tributaries to Chesapeake Bay. However, all indices except for the Virginia tributaries still remain far below the long-term average. These findings emerged from a January 13-14 workshop in Woods Hole--held under the auspices of the Emergency Striped Bass Study--which reviewed recent research on the striper.

Field studies during 1986 showed reduced survival (relative to controls) of larval stripers in the Nanticoke and Potomac Rivers, but not in the Delaware and Chesapeake Canal. The reduced survival in the Nanticoke and Potomac appeared to be linked to poor water quality (low pH, heavy metal contamination, etc.). Water quality in the Canal, though, appeared to be good for survival of larval stripers. The combination of low pH and aluminum contamination can be an important cause of larval mortality in some areas and years. An analysis, though, of the number and severity of low pH events before and after striped bass began their decline of recent years has provided no evidence that an increase in acid precipitation/deposition is the culprit in the overall striper decline.

During February, these findings were incorporated into the draft annual report to Congress on the status of the Emergency Striped Bass Study. The final report, which will be available to the public, should be ready in early to mid-summer. Contact Dr. R. Anne Richards, FTS 840-1357 or (617) 548-5123.

YELLOWTAIL FLOUNDER LANDINGS INCREASE

U.S. landings of yellowtail flounder from the Georges Bank and Southern New England fisheries increased in 1986. This was the first increase since 1983. Based on preliminary data, the 1986 landings from these two fisheries should exceed 13.3 million pounds. In both fisheries, landings increased due to a spurt in catches of small yellowtails (i.e., the newly recruiting 1984 year class) during the fourth quarter of the year.

These commercial fisheries data, as well as the Center's 1986 bottom trawl survey data, indicate improved recruitment from the 1984 year class on both Georges Bank and in Southern New England. Although this year class appears to be larger than those in 1982 and 1983, we can't consider it a strong one and we don't expect it to sustain elevated landing levels beyond 1987. Contact Margaret M. McBride or Dr. Fredric M. Serchuk, FTS 840-1246/1245 or (617) 548-5123.

VARIATION IN WINTER FLOUNDER REPRODUCTIVE EFFICIENCY

A joint Center-EPA study has shown significant variation in winter flounder reproductive efficiency in Long Island Sound. These results are based on a sampling of eggs, embryos, and yolk-sac larvae from 90 flounders collected during the 1986 spawning season at six sites in the Sound subject to various kinds and amounts of pollution. The six sites were Hempstead and Shoreham in New York, and Hammonasset, Milford, New Haven (Morris Cove), and Norwalk in Connecticut. Using the criteria of fertilization success, prehatch mortality, larval malformation, and size at hatch, we found the Shoreham flounders to have the best reproductive efficiency, Morris Cove the worst. Embryos and larvae from Shoreham had a five-fold greater survival rate than those from Morris Cove. Contact Dr. Anthony Calabrese, FTS 642-5200 or (203) 783-4200.

SIX NEW EDIBILITY PROFILES FOR NORTHEAST FISHES

In our continuing effort to determine the edibility characteristics (i.e., flavor and texture) of Northeast fish species, we have developed new profiles for American plaice, winter flounder, red hake, silver hake, cusk, and ocean pout. These profiles, along with others being developed by the National Marine Fisheries Service's Seattle (Washington) and Charleston (South Carolina) Laboratories, will become part of a national data base and of a publication which will compare the edibility characteristics of fish species throughout the country. Contact Joseph M. Mendelsohn, FTS 837-9282 or (617) 281-3600.

INTERACTION OF HEAVY-METAL CONTAMINANTS IN SEA SCALLOPS

Recent Center studies on the effects of heavy-metal contaminants on sea scallop physiology have yielded information on the means by which two metals--cadmium and copper--interact (i.e., synergize) to change their separate toxicities. Our earlier studies of the effects of heavy metals on sea scallops had shown that cadmium is normally detoxified by the scallop kidney. Continuing studies have now shown that this detoxification occurs when the kidney, responding to the presence of cadmium, produces large amounts of a protein (i.e., CdBP) which binds to the heavy metal and immobilizes it. When even a small amount of copper is present though, the copper displaces the cadmium from the binding protein, releasing the cadmium to interfere with the scallop's physiological health. The presence of copper can also disrupt the scallop's ability to control other heavy metals such as zinc and manganese.

These findings indicate that pollutant-effect studies that look at one heavy metal at a time, and don't consider the synergistic effects of multiple contaminants (i.e., what is usually found in degraded habitats), can consistently underestimate the physiological harm to marine organisms. Contact Edith Gould, FTS 642-5222 or (203) 783-4222.

FISH EYE LESIONS AS INDICATORS OF ENVIRONMENTAL CONTAMINATION

The presence of eye lesions (i.e., cataracts) in fishes could serve as an early indicator of environmental contamination. This conclusion is one of several from a report prepared by the Virginia Institute of Marine Science under contract to the Center. Copies of the report, "Histopathological Analysis of Tissue Sections of the Eyes of Indigenous (to Chesapeake Bay) Species of Marine and Estuarine Fish," are available. Contact Dr. Aaron Rosenfield, (301) 226-5193.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

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MARCH 1987

IN THIS ISSUE:

NORTHEAST'S '86 LANDINGS DOWN IN WEIGHT, UP IN VALUE

U.S. LANDINGS OF YELLOWTAIL FLOUNDER DECLINE ON "TAIL OF THE BANK"

STATUS OF TRANSBOUNDARY FISHERIES RESOURCES AND RELATED RESEARCH REVIEWED

STERILE HADDOCK FOUND IN NORTHWEST ATLANTIC

LYMPHOCYSTIS DISEASE REAPPEARS AMONG LONG ISLAND SOUND STRIPERS

ABSTRACTS AVAILABLE FOR SHELLFISH BIOLOGY SEMINAR PRESENTATIONS

SIX NEW SPECIES OF INDO-PACIFIC CLUPEOIDS DESCRIBED

TRAWL GEAR CHANGES DON'T AFFECT SURVEY CATCH RATES OF SUMMER FLOUNDER

PILOT PLANT BUILT TO CONVERT FISH WASTES INTO AGRICULTURAL FEED/FERTILIZER

NATIONAL FISHING WEEK IS JUNE 1-7

The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

NORTHEAST'S '86 LANDINGS DOWN IN WEIGHT, UP IN VALUE

Preliminary data show that commercial harvests of New England and Mid-Atlantic fish and shellfish during 1986 were down in weight, but up in value. In New England, landings during 1986 were 556 million pounds valued at 449 million dollars. These figures are down 34 million pounds, but up 29 million dollars, from 1985. New England landings of Atlantic cod, haddock, and yellowtail flounder during 1986 were down 26 million pounds from 1985, accounting for most of the overall decrease. Top New England species in weight for 1986 were Atlantic herring (70 million pounds), Atlantic cod (61 million pounds), and American lobster (43 million pounds). Top New England species in value for 1986 were American lobster (112 million dollars), sea scallop (61 million dollars), and Atlantic cod (36 million dollars).

In the Mid-Atlantic states, landings in 1986 were 775 million pounds valued at 245 million dollars. These figures are down 203 million pounds, but up six million dollars, from 1985. Top Mid-Atlantic seafood species in weight for 1986 were hard blue crabs (86 million pounds live weight), surf clams (69 million pounds meat weight), and ocean quahogs (43 million pounds meat weight). Top Mid-Atlantic seafood species in value for 1986 were surf clams (37 million dollars), sea scallops (29 million dollars), and hard blue crabs (28 million dollars).

Summary reports comparing the weights and values of 1985 and 1986 landings on a regional, state, port, and species basis are available. Contact Ronnee L. Schultz, FTS 840-1264 or (617) 548-5123.

U.S. LANDINGS OF YELLOWTAIL FLOUNDER DECLINE ON "TAIL OF THE BANK"

Preliminary data show that U.S. landings of yellowtail flounder from that portion of the Grand Banks of Newfoundland outside the Canadian 200-mile limit (i.e., the "Tail of the Bank") dropped from 8.5 million pounds in 1985 to 5.7 million pounds in 1986. During the same 1985-to-1986 period, U.S. yellowtail landings from all other areas actually increased 600 thousand pounds (due to a 1.4 million pound increase in the Georges Bank and Southern New England fisheries--see the February 1987 issue of *Monthly Highlights*). The 2.8 million pound decrease in U.S. yellowtail landings from the Tail of the Bank, however, brought about an overall decrease in total U.S. yellowtail landings from 24.9 to 22.7 million pounds. This U.S. fishery directed at Tail-of-the-Bank yellowtail, although time consuming (i.e., a four-day steam each way) and fuel expensive, began in April 1985. Contact Ralph K. Mayo, FTS 840-1310 or (617) 548-5123, or Margaret M. McBride, FTS 840-1246 or (617) 548-5123.

STATUS OF TRANSBOUNDARY FISHERIES RESOURCES AND RELATED RESEARCH REVIEWED

Center scientists met with their Canadian counterparts for the ninth annual round of informal discussions on the status of fisheries resources and related research in the Northwest Atlantic. This year's meeting was held at the Bedford Institute of Oceanography in Halifax, Nova Scotia, during March 9-13, 1987. (continued on back)

Primary topic of the meeting was the status of the transboundary stocks of Atlantic mackerel, pollock, Georges Bank cod, and Georges Bank haddock, especially the potential for the 1985 year class of Georges Bank haddock (the only significant year class left in that stock) to reseed that depleted population, as well as the potential for a seasonal closure of the haddock fishery on the Northern Edge and Northeast Peak of Georges Bank to protect that year class. Other topics were: growth processes in marine animals, use and application of population dynamics and assessment models, methods to evaluate effort in mixed-species trawl fisheries, and research and data needs to evaluate biological effects of any oil exploration and development on Georges Bank. Contact Dr. Tim D. Smith, FTS 840-1251 or (617) 548-5123.

STERILE HADDOCK FOUND IN THE NORTHWEST ATLANTIC

About seven percent of the presumably sexually mature haddock examined during the Center's 1986 spring and autumn bottom trawl surveys of Georges Bank and Browns Bank were apparently sterile. The affected fish showed severe atrophy of the gonads. Among the immature haddock that were examined by Center scientists, a number of the developing female gonads were infected with white nodules. We saved these white-nodule-infected specimens for later histological analysis. Contact John J. Ziskowski, FTS 642-5256 or (203) 783-4256.

LYMPHOCYSTIS DISEASE REAPPEARS AMONG LONG ISLAND SOUND STRIPERS

After an absence of 14 years, lymphocystis disease has reappeared among striped bass overwintering in the warmwater discharge of the Northport, Long Island, New York, power plant. Lymphocystis is a highly infectious viral disease which appears as pearl-like tumors on the skin and fins. It usually does not kill the fish, but leaves it weakened and more vulnerable to other diseases, parasites, etc.

The Northport power plant's thermal discharge attracts--and thus concentrates--stripers during the coldwater months. The concentration of fish not only produces an excellent sport fishery, it also promotes the prevalence and intensity of diseases such as lymphocystis. To help control the Northport outbreak, the New York Department of Environmental Conservation has instructed anglers not to return severely infected stripers to the water. Contact John J. Ziskowski, FTS 642-5256 or (203) 783-4256.

ABSTRACTS AVAILABLE FOR SHELLFISH BIOLOGY SEMINAR PRESENTATIONS

The Center held its annual Shellfish Biology Seminar on March 3 in Milford, Connecticut. An audience of 125 shellfish scientists, commercial shellfish farmers, and academicians heard papers on shellfish recruitment studies in Long Island Sound and on how environmental, biological, and geological variables affect setting and juvenile growth of mussels, oysters, and hard clams. Abstracts of all presentations are available. Contact Dr. Walter G. Blogoslawski, FTS 642-5235 or (203) 783-4235.

SIX NEW SPECIES OF INDO-PACIFIC CLUPEOIDS DESCRIBED

Six new species of Indo-Pacific clupeoids (herrings, sardines, and anchovies) have been described by a recently departed visiting scientist at the National Systematics Laboratory (NSL), Dr. Thosaporn Wongratana, based on his work while at NSL. Dr. Wongratana, a member of the Faculty of Science at Thailand's Chulalongkorn University, has described four new species of clupeoids from Australian waters, and has in press a description of two new species of Pacific anchovies. These new species descriptions are of particular interest to the Southwest Fisheries Center's Honolulu Laboratory and to Pacific fisheries managers because clupeoid species are extremely difficult to distinguish and are very important as food and bait (for tuna). Contact Dr. Bruce B. Collette, FTS/(202) 357-2524.

TRAWL GEAR CHANGES DON'T AFFECT SURVEY CATCH RATES OF SUMMER FLOUNDER

Switching from BMV trawl doors to polyvalent trawl doors in the Center's bottom trawl surveys apparently has no significant effect on the catch rate of summer flounder (fluke). This preliminary finding emerged from a statistical analysis of the results of a December 1986 cruise of the NOAA fisheries research ship *Albatross IV* designed to compare summer flounder catch rates using the different doors. As expected, catch rates with each set of doors were affected by time of day, with more summer flounder being caught during evening and night hours.

The BMV doors, which were used in the Center's surveys beginning in 1963, were replaced by the polyvalent doors in 1985. The December 1986 experiment with the doors was part of a continuing series of experiments begun in 1982 to evaluate effects of gear configuration and vessel fishing power on survey catch rates. Contact Charles J. Byrne (gear comparison), FTS 840-1224 or (617) 548-5123, or Janice R.S. Forrester (statistical analysis), FTS 840-1370 or (617) 548-5123.

PILOT PLANT BUILT TO CONVERT FISH WASTES INTO AGRICULTURAL FEED/FERTILIZER

The Center has designed and built a pilot plant to convert solid fish wastes into a liquid fish mixture which could be used as plant fertilizer or animal food. This effort addresses a recurring problem of fish processors on how to--effectively, efficiently, and safely--dispose of the solid fish wastes from fish processing operations. The problem currently limits the restoration, maintenance, or growth of several commercial fishing ports in the Northeast.

The pilot plant uses Atlantic cod "frames" (what's left after filleting) and daily turns out 300 pounds of liquified fish, or fish "hydrolysate." We are now chemically testing the resulting hydrolysate to establish its nutritional and safety qualities. Contact Vincent G. Ampola, FTS 837-9248 or (617) 281-3600.

NATIONAL FISHING WEEK IS JUNE 1-7

National fishing Week'87
June 1-7
Take a Kid Fishing

National Fishing Week
June 1-7, 1987

President Reagan has proclaimed June 1-7, 1987, as National Fishing Week, recognizing the 60 million U.S. residents who participate in recreational fishing, and the 28 billion dollars they contribute annually to the economy. National Fishing Week was first established by the American Fishing Tackle Manufacturers Association in 1979, but this is only the second year that it has been recognized by Congress and the President.

The National Marine Fisheries Service is one 13 public and private organizations on the National Fishing Week Steering Committee. Under the Committee's guidance, a number of activities are planned to commemorate the Week, including seminars, fishing clinics, exhibits, contests, special tours, brochures, and information packets. Contact Thomas R. Morrissey, FTS 840-1236 or (617) 548-5123.

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The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

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National Marine Fisheries Service
Northeast Fisheries Center

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MARYLAND TO SHARE USE OF OXFORD LABORATORY

On April 24, 1987, Dr. Anthony Calio, NOAA Administrator, and Dr. Torrey Brown, Maryland Department of Natural Resources (MDNR) Secretary, signed a five-year agreement for the joint use of the Center's Oxford (Maryland) Laboratory by NOAA's National Marine Fisheries Service and the MDNR. Under the agreement, the MDNR will assume day-to-day costs of running the facility, while NOAA will retain ownership.

The 13,000-square-foot facility currently houses 22 biologists and other employees of the National Marine Fisheries Service (most with the Center). Research at the facility will stay centered on shellfish diseases, with Center biologists focusing on diseases principally in the Northwest Atlantic, and MDNR biologists focusing on diseases (especially of oysters) in Chesapeake Bay. Contact Dr. Michael P. Sissenwine, FTS 840-1234 or (617) 548-5123.

PRELIMINARY FINDINGS ASSOCIATE SEDIMENT CONTAMINANTS WITH FISH LESIONS

The Center has completed a final report on fish disease data collected in 1984 as part of NOAA's Status & Trends (S&T) Program (which looks at long-term changes in the environmental quality of the nation's coastal and estuarine habitats). This report, as well as another final report completed earlier on sediment contaminant data also collected in 1984 as part of the S&T Program, have been incorporated into the S&T Program's "Progress Report and Preliminary Assessment of Findings of the Benthic Surveillance Project - 1984." The compiled report is available from Marjorie C. Ernst, FTS/(301) 443-8655.

Because we have analyzed only one year's worth of data, and because we haven't analyzed those data in detail (e.g., accounting for different sample sites, fish ages, lesion severities, etc.), any conclusions must be preliminary and subject to change. However, it appears that certain liver and kidney lesions in the fish species being monitored (e.g., winter flounder, Atlantic croaker, etc.) correlate well with the presence of high levels of some sediment contaminants.

FOURTH STOCK ASSESSMENT WORKSHOP HELD

The Center held its fourth semiannual stock assessment workshop in Woods Hole during March 30 - April 3. Workshop participants, including scientists from federal and state agencies, regional fishery management councils, the Atlantic States Marine Fisheries Commission (ASMFC), and academic institutions, reviewed updated assessments of butterfish, Atlantic mackerel, long-finned squid, short-finned squid, scup, silver hake, American plaice, and the 1985 year class of Georges Bank haddock. Special discussion topics were bluefish stock assessment methods, striped bass fishery-independent monitoring, shellfish discard mortality studies using submersibles, effort-measurement methods for mixed-species trawl fisheries, inshore research initiatives, and mackerel biomass estimation from ichthyoplankton surveys.

Discussions of individual stock assessments provided the New England and Mid-Atlantic Fishery Management Councils and the ASMFC with scientific advice needed in their management processes. Workshop information will also contribute to the Center's annual report (now in preparation) on the "Status of the Fishery Resources Off the Northeastern United States." Contact Dr. Tim D. Smith, FTS 840-1251 or (617) 548-5123.

SALMON WORKING GROUPS ADDRESS ACID RAIN AND INTERCEPTION ISSUES

Two Atlantic salmon working groups of the International Council for the Exploration of the Sea (ICES) met in Copenhagen, Denmark, in March to address two key issues. U.S. participants included scientists from the Center, the U.S. Fish and Wildlife Service, and Maine's Atlantic Sea Run Salmon Commission.

The first working group addressed acid precipitation and its effects on Atlantic salmon stocks in North America. Both chemical and biological properties of salmon habitat were considered in developing estimates of habitat damage, and potential habitat damage, by acid precipitation. Various measures were also considered for mitigating damage by acid precipitation.

The second working group addressed the mixed-stock fisheries off the Faroe Islands, Greenland, and Newfoundland, and their effect on home-water returns. Tagging experiments have indicated that the number of Marine-origin salmon intercepted in the Greenland and Newfoundland fisheries almost equals the number of Maine-origin salmon returning to their home waters. A stock-discrimination technique using scales, however, indicates that the number of Maine-origin salmon being intercepted may be significantly greater than previously thought.

Working group reports are available. Contact Dr. Kevin E. Friedland, FTS 840-1369 or (617) 548-5123.

GULF STREAM MEANDER AFFECTS LOBSTER AND CRAB FISHERMEN

Lobster and crab fishermen working in the area of Hydrographer Canyon southeast of Cape Cod during early April encountered currents which were too strong and water temperatures which were too high to set and/or fish their gear. Eastward currents of 3-4 knots and surface temperatures of 68-70° F resulted from a large northward meander of the Gulf Stream which began to form and move into the slope-water region in early March.

Satellite imagery throughout late March showed the north wall of the meander coming within eight nautical miles of the continental shelf break. After a cloudy period from March 28 to April 2, the imagery showed a strong thermal front (a temperature difference of 25° F) up against the shelf break. Subsequent satellite imagery showed the meander in the process of pinching off and forming a warm-core ring, but not before it had absorbed another already existing ring, and had caused extensive warm-water entrainment in two others. Contact LTJG Kenneth Barton, FTS 838-6284 or (401) 782-3284.

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NORTHEAST FISHERIES CENTER

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MAY 1987

IN THIS ISSUE:

WEEKLY CHARTS OF SURFACE TEMPERATURES AVAILABLE TO FISHERMEN

IDENTIFICATION GUIDE PUBLISHED FOR LOBSTER TAILS IN U.S. TRADE

REPORT AVAILABLE ON 1986 DUMPING AT 106-MILE SITE

NATIONAL SYSTEMATICS LABORATORY ANNUAL REPORT AVAILABLE

The Northeast Fisheries Center's *Monthly Highlights* is an adminstrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

WEEKLY CHARTS OF SURFACE TEMPERATURES AVAILABLE TO FISHERMEN

The Center is producing a weekly series of near-shore, sea-surface, temperature-contour charts between now and October for interested fishermen and researchers. The four charts in the series cover four areas (i.e., Gulf of Maine including Georges Bank, Great South Channel to Montauk Point, Montauk Point to mid-New Jersey including Long Island Sound, and mid-New Jersey to mid-Maryland) from the coastline to just seaward of the 2000-fathom depth contour. The charts are based on infrared data collected from NOAA satellites not more than 24 hours before the charts are mailed out. Contact Carol A. Price, FTS 838-6284 or (401) 782-3284.

IDENTIFICATION GUIDE PUBLISHED FOR LOBSTER TAILS IN U.S. TRADE

U.S. imports of lobsters exceed U.S. landings of lobsters, particularly for spiny lobsters (Superfamily Palinuroidea) where the average annual landings for 1975-84 were 6.2 million pounds, but the average annual imports for the same period were 41.6 million pounds. The approximately 30 species of spiny lobsters which contribute to these imports are difficult to identify because they usually consist of tails only; the remaining parts of the lobster bodies that provide many useful diagnostic characters are lacking. To allow customs inspectors, other regulatory agency personnel, and importers to identify these imports properly, and to ascertain the country of origin, an identification guide to fresh/frozen lobster tails in U.S. trade has been published in *Marine Fisheries Review* (volume 48, issue 2). The guide features an identification key illustrated with line drawings and color photographs, and reviews the world catch and U.S. trade. Contact Dr. Austin B. Williams, FTS/(202) 357-2639.

REPORT AVAILABLE ON 1986 DUMPING AT 106-MILE SITE

The Center has prepared a report on waste dumping from October 1985 to September 1986 at the 106-mile site off New York-New Jersey. The report, labelled "Data Analysis Product No. 23" of the Center's Marine Climatology Investigation, describes conditions at the dumpsite and correlates the dumping of wastes with the type of water mass (e.g., shelf, slope, Gulf Stream, or warm-core ring) receiving the wastes, based on NOAA satellite infrared imagery and EPA dumping records.

Regulations imposed by EPA in March 1986 call for the 106-mile site, which has already been receiving industrial wastes for 10 years, ultimately to receive all municipal sludge generated by New York City, two New York counties, and six New Jersey municipalities. Based on 1985 totals of industrial and municipal waste dumping at the 106-mile site, it is estimated that the site will receive two *billion* gallons of waste annually. Contact LTJG Kenneth W. Barton, FTS 838-6284 or (401) 782-3284.

NATIONAL SYSTEMATICS LABORATORY ANNUAL REPORT AVAILABLE

The annual report of the National Systematics Laboratory's research and service activities during 1986, including a publications list, is now available. The Laboratory's research focuses on the production of taxonomic monographs and identification aids for fishes, crustaceans, squids, and corals. Contact Dr. Bruce B. Collette, FTS/(202) 357-2524.

J Brownlow

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

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JUNE 1987

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ALGAL SPECIES RANKED AS NUTRITIONAL SOURCES FOR HARD CLAMS

***** FOUNDER AND 31-YEAR DIRECTOR OF MILFORD LABORATORY DIES *****

The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

SILVER HAKE STOCKS SLOWLY INCREASING

The Center has reassessed the stocks of Northwest Atlantic silver hake: the Gulf of Maine-Northern Georges Bank stock and the Southern Georges Bank-Middle Atlantic stock. Biomass of both stocks is increasing slowly. Consequently, the catch from the Gulf of Maine-Northern Georges Bank stock could increase to 23.6 million pounds in 1987 from 18.7 million pound in 1986 without affecting (i.e., no increase in) stock biomass for next year (1988), *assuming that the level of recruitment is equal to the average of the last five years.* The catch from the Southern Georges Bank-Middle Atlantic stock could increase to 27.8 million pounds in 1987 from 22.3 million pounds in 1986 without affecting stock biomass for next year, *again assuming average recruitment.* Contact Frank P. Almeida, FTS 840-1308 or (617) 548-5123.

PREDATION MEASURED ON YOUNG-OF-THE-YEAR HADDOCK AND ATLANTIC COD

During a June survey of Georges Bank, we found 17 percent of the predacious fishes -- representing several species -- to have young-of-the-year (YOY) haddock and Atlantic cod in their stomachs. June is the month when YOY haddock and cod rapidly switch from a midwater to a bottom-dwelling existence, and may be the most vulnerable point in the survival of a year class up to the time of recruitment to the fishery. We will estimate predation rates on YOY haddock and cod from these June survey data and will use the estimates in mathematical models designed to evaluate the relative importance of this early life stage in the recruitment process. Contact Dr. Marvin D. Grosslein, FTS 840-1252 or (617) 548-5123.

PCB LEVELS AND GENETIC ABNORMALITIES RECORDED FOR EARLY-LIFE-STAGE WINTER FLOUNDER

As part of the Center's ongoing study of winter flounder reproductive success, we've analyzed flounder eggs from Long Island Sound for PCB levels, and flounder embryos from Long Island Sound and Boston Harbor for genetic abnormalities. We found, as expected, that eggs collected from females in the less polluted habitats of eastern Long Island Sound had lower PCB levels than eggs from females in the more polluted habitats of western Long Island Sound.

We also found embryos from Boston Harbor to have a high incidence and severity of faulty cell differentiation which is generally associated with subsequent tumor development. Previous field studies with Atlantic mackerel, Atlantic cod, and pollock embryos have shown aromatic hydrocarbon pollution to be linked to such faulty cell differentiation. Boston Harbor has significant aromatic hydrocarbon pollution and a high incidence of adult winter flounder tumors. For PCB information, contact Dr. Frederick P. Thurberg, FTS 642-5244 or (203) 783-4244; for genetic information, contact Dr. Arlene Longwell, FTS 642-5207 or (203) 783-4207.

BOSTON & SALEM HARBORS AND LOWER NEW YORK BAY STILL MOST CONTAMINATED WITH HEAVY METALS

We have completed our analyses and prepared a report on heavy metal concentrations in sediment samples collected at 17 sites during the second year (1985) of monitoring for the National Status and Trends Program's Benthic Surveillance Project. At the 12 sites for which there are now two year's of observations, no significant changes in metal concentrations were apparent; Boston and Salem Harbors and Lower New York Bay remain the most contaminated sites in the Northeast.

Five sites were examined for the first time in 1985: Frenchman's Bay (Maine), Penobscot Bay (Maine), Great Bay (New Jersey), upper Chesapeake Bay (near Baltimore), and mid-Chesapeake Bay (near the Potomac River mouth). Of the 17 metals analyzed, only zinc and chromium levels in Penobscot and Great Bays, and zinc, chromium, and nickel levels in upper Chesapeake Bay, appear to be elevated. Contact Vincent Zdanowicz, FTS 342-8232 or (201) 872-0200.

LARVAL SETTLEMENT OF BENTHIC INVERTEBRATES DIVERSELY AFFECTED BY HEAVY METALS

Our experiments on the effects of sediment-bourne heavy metals on larval settling and colonization by benthic invertebrates suggest that benthic invertebrate populations that inhabit chronically contaminated environments can develop a tolerance for — or at least a lack of avoidance of -- heavy metal contaminated sediments. This observation comes from a preliminary analysis of benthic invertebrate colonization patterns among an array of field-planted trays containing either "clean" sediment or sediment with metals added to approximate both the "average" and the "most contaminated" sediments in heavily polluted Raritan Bay. One array of trays was planted in Sandy Hook Bay, a moderately polluted habitat just east of Raritan Bay. Another array was planted in Barnegat Bay, a relatively clean habitat about 30-40 miles south of Sandy Hook Bay.

In Barnegat Bay, nematodes, polychaetes, and harpacticoid copepods settled in significantly higher numbers in the clean sediment. In Sandy Hook Bay though, there were no significant differences in settlement of the same invertebrates between clean and average contaminated sediments; polychaete settlement also was not significantly different among the clean, average, and most contaminated sediments; and amphipod settlement was actually greater in the average and most contaminated sediments than in the clean sediment.

We repeated the experiment for just Barnegat Bay to determine which metal(s) was (were) most limiting to larval settlement in a relatively clean habitat. Results showed cadmium to be the most toxic metal to be tested. Contact Clyde MacKenzie, FTS 342-8258 or (201) 872-0200.

OYSTER DISEASE SPREADS TO NEW AREAS IN CHESAPEAKE BAY

Last November, the Center detected — for the first time — the oyster disease MSX in the Tred Avon River, a tributary of the eastern shore of Chesapeake Bay (MSX does not affect humans who eat infected oysters, but it does kill the oysters). Recent samples now show a 44 percent prevalence of this disease in this key oyster production area.

The area's oystermen are counting on the 1985-year-class oysters to bolster harvests when they reach the three-inch legal size limit next year, but the MSX outbreak will likely reduce that recruitment. An ongoing drought in the area, which has decreased freshwater runoff and increased estuarine salinities, has favored the spread of MSX's causative pathogen, *Haplosporidium nelsoni*. Contact Earl Jay Lewis, (301) 226-5193.

INFECTIOUS SARCOMA DISEASE AGAIN REDUCING UPPER CHESAPEAKE BAY'S SOFTSHELL CLAM POPULATIONS

In the October 1986 issue of *Monthly Highlights*, we noted the high prevalence of infectious sarcoma disease in softshell clams collected at our monthly sampling site in upper Chesapeake Bay — Swan Point. A recent survey throughout the Maryland waters of the upper Bay, conducted in response to the high Swan Point prevalences, has confirmed a resurgence of the disease throughout the region's clam populations.

The preliminary diagnosis of softshell clams collected at nine sampling sites in the upper Bay has shown a number of the clams from each site, except one, to have infectious sarcoma disease. We are now conducting detailed diagnosis of the sampled clams to determine specific prevalence rates. Should prevalence rates remain high, and should younger clams be affected, harvests of marketable-sized clams would be significantly reduced this coming winter. Contact Austin C. Farley, (301) 226-5193.

AGREEMENT REACHED ON SALMON INTRODUCTIONS/TRANSFERS AND FISHERIES ALONG ATLANTIC NORTH AMERICA

At the North Atlantic Salmon Conservation Organization's (NASCO) 1987 Annual Meeting in Edinburg, Scotland, during June 8-12, NASCO's North American Commission agreed upon: (1) a common approach for controlling salmonid introductions and transfers; and (2) a continuance of the October 15 closure for the Newfoundland/Labrador fishery. These two conservation efforts will be supplemented by NASCO's West Greenland Commission which had agreed at the 1986 Annual Meeting to a *two-year*, 850-metric-ton annual quota in the West Greenland fishery. All three steps should provide better protection for Atlantic salmon originating in U.S. rivers.

The Soviet Union also joined NASCO, thus bringing every salmon producing/harvesting nation in the North Atlantic into the Organization. Contact Dr. Kevin E. Friedland, FTS 840-1369 or (617) 548-5123.

ALGAL SPECIES RANKED AS NUTRITIONAL SOURCES FOR HARD CLAMS

The Center has compared and ranked -- under laboratory conditions -- five algal species as nutritional sources for juvenile hard clams (*Mercenaria mercenaria*). The findings show that a pennate diatom, *Nitzschia* sp., common to eastern Long Island Sound's phytoplankton, promotes rapid clam growth, and that a chain-forming centric diatom, strain O-12, doesn't support clam growth. The findings will aid in interpreting our field data on the relationships between natural phytoplankton assemblages and growth of experimentally planted clam populations in Long Island Sound. Contact Gary H. Wikfors, FTS 642-5225 or (203) 783-4225.

***** FOUNDER AND 31-YEAR DIRECTOR OF MILFORD LABORATORY DIES *****

Dr. Victor L. Loosanoff, who founded the Center's Milford (Connecticut) Laboratory in 1931 and directed it until 1962, died June 15 in Greenbrae, California, at age 87. Born in Kiev, Russia, in 1899, Dr. Loosanoff received a military academy education there before escaping the Russian Revolution and immigrating to the United States. He received his BS in aquatic biology from the University of Washington in 1927, and his PhD in zoology from Yale University in 1936.

During his tenure at Milford, he was responsible for the design and construction of the main laboratory in 1939-40, and similarly of the laboratory's 50-foot research vessel *Shang Wheeler* launched in 1951. In 1962, he stepped down as Laboratory Director to become Senior Scientist at the Tiburon (California) Laboratory, and concurrently Adjunct Professor at the College of the Pacific. Although he retired from the federal government in 1966, he continued to serve as consultant to the Bureau of Commercial Fisheries (now NMFS) and the shellfish industry, as well as to conduct research under a National Science Foundation grant.

As an internationally recognized expert on oyster ecology and physiology, Dr. Loosanoff's research at Milford and that of colleagues under his direction formed the basis of molluscan aquaculture as practiced commercially today in the United States and abroad. He authored some 200 scientific papers and popular articles. His works are widely quoted in the current literature and constitute a significant portion of the information available on shellfish biology and culture. *We will miss him.* Contact Dr. James E. Hanks, FTS 642-5251 or (203) 783-4251.

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JULY 1987

IN THIS ISSUE:

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RECENT PUBLICATIONS AND REPORTS

The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

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Contact: Frederick G. Kern

COMMERCIAL SCALLOP DREDGING DIRECTLY OBSERVED WITH A RESEARCH SUBMERSIBLE

Commercial sea scallop fishing operations appear to: (1) capture with high efficiency those scallops which are within the path of the scallop dredge; (2) cause very low mortality among those scallops which are within the path of the dredge, but which are not captured by it; and (3) result in low mortality (i.e., less than 10 percent) of those scallops which are captured, but which are subsequently discarded. These observations come from the Center's July 15-17 study of commercial scalloping by the fishing vessels *Carolina Breeze* and *Mary Anne* in 175-220 feet of water in the Hudson Canyon area of the Middle Atlantic Shelf. Center scientists used the two-man research submersible *Delta* to observe fishing operations directly. Contact Dr. Fredric M. Serchuk, FTS 840-1245 or (617) 548-5123.

METHOD APPROVED FOR DETERMINING RELATIVE PROPORTIONS OF FILLETS AND MINCED FLESH IN FISH BLOCKS

The Association of Official Analytical Chemists has approved a Center-developed method for determining the relative proportions of fish fillets and minced fish flesh in fish blocks containing both items. (A fish block is a large frozen block of fused fish flesh from which such products as fish sticks are obtained.) The newly approved method is the first step in allowing fish blocks which contain both items to be graded by U.S. Department of Commerce inspectors. Results of the method are also admissable in a court of law. Contact Robert J. Learson, FTS 837-9313 or (617) 281-3600.

BLUEFIN TUNA AGING TO BECOME MORE RELIABLE

Northeast Fisheries Center (NEFC) scientists have assisted their counterparts at the Southeast Fisheries Center (SEFC) by meeting tuna purse-seining vessels as they unload their catches and by collecting otoliths (ear stones) from three tagged Atlantic bluefin tuna in the vessels' catches. These are the first otoliths collected from tagged tuna in the federal government's 33-year-old tuna tagging program which began at the NEFC's Woods Hole Laboratory and is currently administered by the SEFC's Miami Laboratory.

Bluefin tuna are easy to age up to about age 4 because of size differences, but after age 4 the sizes at different ages can overlap, forcing scientists to rely on otoliths or other similarly hard body parts to decipher age. Tuna otoliths should portray tuna age and growth much the way tree trunks portray tree age and growth, but there has never been verification that the light-dark bands in tuna otolith cross-sections are reliable annular marks. These recent collections by NEFC scientists of otoliths from three tuna that had been tagged many years ago at a small (i.e., known-age) size, should establish the degree of reliability of present and future tuna age-and-growth data, and thus the degree of reliability of present and future tuna management regulations which are based on such data. Contact Darryl J. Christensen, FTS 840-1351 or (617) 548-5123.

FLOUNDER READILY INGEST OIL-CONTAMINATED PREY

One-year-old winter flounder will readily approach and ingest sandworms — a favorite prey -- which have been heavily contaminated with crude oil. These findings emerged from Center studies which are designed to measure the effects of oil contamination, low dissolved oxygen, and other perturbations on the normal activity and feeding of age 0 and age 1 flounders. A future study will examine the effects of oil uptake in young flounders through such prey ingestion. Contact Allen Bejda or Beth Valdez, FTS 342-8200 or (201) 872-0200.

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J. Brawnlow

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AUGUST 1987

IN THIS ISSUE:

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REPORT AVAILABLE ON STATUS OF *NORTHEAST* ATLANTIC FISH STOCKS

The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

FISHERMEN'S REPORT AVAILABLE FOR SEA SCALLOP SURVEY

The Center's *Fishermen's Report* on the 1987 research vessel survey of the Northeast's sea scallop resource is available for the asking. It contains information on the total number and shell-height/meat-weight composition of sea scallops captured at each sampling site, as well as the Loran C bearings, depth, and bottom temperature of each site. Sampling occurred from July 6 through August 13 on board the NOAA research vessel *Albatross IV*.

Turnaround time from when the cruise ends to when the *Fishermen's Report* is mailed out has dramatically improved (i.e., from two weeks to 2-3 days) as a result of the sampling data being placed into computer files while still at sea. To receive a copy of this issue of the *Fishermen's Report*, or to be placed on the mailing list for one or more of the four reports issued annually in this series (i.e., those for the spring bottom trawl, surf clam - ocean quahog, sea scallop, and autumn bottom trawl surveys), contact Linda I. Despres-Patanjo, FTS 840-1346 or (617) 548-5123.

NORTHERN SHRIMP ABUNDANCE AND BIOMASS DECREASED IN GULF OF MAINE

Northern shrimp abundance and biomass in the Gulf of Maine appear to be down almost 30 percent from a year ago. These findings stem from the fifth annual survey of the Gulf of Maine's northern shrimp resource, conducted during August 3-14 on board the Center's research vessel *Gloria Michelle*, with the cooperation of the Maine Department of Marine Resources, New Hampshire Fish and Game Department, and Massachusetts Division of Marine Fisheries.

As in previous surveys, abundance was highest off south-central Maine, and considerably lower in southern and eastern portions of the Gulf. The outlook for the 1987-88 winter fishery isn't as good as that for the past two years. Contact Dr. Stephen H. Clark, FTS 840-1312 or (617) 548-5123.

BOTTLENOSED DOLPHIN SURVEY CONDUCTED; HARBOR PORPOISE SURVEY METHODS EVALUATED

Harbor porpoise abundance in the Gulf of Maine - Bay of Fundy area can be effectively estimated by a ship-based, line-transect method of survey. This determination by Center scientists results from an August 20-22 research cruise of the Center's research vessel *Gloria Michelle*. Improved data on harbor porpoise abundance is needed to accurately assess the incidental catch of harbor porpoise by the area's gill-net fishermen.

Center scientists also participated in an August 20-25, plane-based, line-transect survey of bottlenosed dolphins in the Mid-Atlantic area in response to the more than 150 bottlenosed dolphin strandings in the previous month. Contact Dr. Tom Polachek, FTS 840-1397 or (617) 548-5123, for harbor porpoise information; Gordon T. Waring, FTS 840-1311 or (617) 548-5123, for bottlenosed dolphin information.

FRESH/FROZEN STORAGE CHARACTERISTICS OF WINTER SKATE WINGS EXAMINED

Because of the market potential for winter skate (i.e., their "wing" meat tastes like shellfish meat and they are not currently overfished), the Center has studied their acceptability as seafood after both fresh and frozen storage. Fresh wings still appear to be acceptable after 12 days on ice, although no more than 3-5 days is probably best. Frozen wings appear to be acceptable after five months at 0 degrees Fahrenheit. These storage studies are continuing. Contact Kurt A. Wilhelm, FTS 837-9308 or (617) 281-3600.

LARGE MARINE ECOSYSYTEMS CATEGORIZED BY FORCES PRINCIPALLY CONTROLLING THEIR FISH STOCK DOMINANCE

Center scientists have examined the principal forces controlling fish stock dominance in the planet's 20-or-so large marine ecosystems (LME's). (LME's are extensive areas — averaging about 75,000 square miles — in which marine biological communities have evolved in response to a unique combination of bathymetry, hydrography, basic nutrients, and circulation.)

In six LME's (California Current, Humboldt Current off Chile, Iberian Coastal, Benguela Current, Oyashio Current, and Kuroshio Current), the forces principally controlling fish stock dominance are oceanographic processes driven by global climate and weather patterns. Consequently, the ability to improve fishing yields of the most desirable species in these LME's will depend, in part, on the ability to improve forecasts of major oceanographic events.

The Northeast U.S. LME has been grouped with three others (Yellow Sea, Gulf of Thailand, and Great Barrier Reef) in which fish stock dominance is principally controlled by predatory forces, including fishing. Consequently, the ability to improve fishing yields of the most desirable species in these LME's will depend, in part, on the ability to improve management of fishing effort/catch. Contact Dr. Kenneth Sherman, FTS 838-6211 or (401) 782-3211.

REPORT AVAILABLE ON STATUS OF *NORTHEAST* ATLANTIC FISH STOCKS

A summary of the assessments of over 80 *Northeast* Atlantic fish stocks, which emanated from this year's meeting of the International Council for the Exploration of the Sea's Advisory Committee on Fishery Management, is available upon request. Significant increases or decreases in European fish stocks have historically affected U.S. imports of European fishery products, and consequently, have affected the domestic markets for U.S. fishery products. Contact Dr. Fredric M. Serchuk, FTS 840-1245 or (617) 548-5123.

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SEPTEMBER 1987

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TUMOR OCCURRENCE IN BOSTON HARBOR FLOUNDER VARIES BY SEX

The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

CONVERTED FISH PROCESSING WASTES OUTPERFORM COMMERCIAL PLANT FERTILIZER

Our experiments show that fish hydrolysate (a liquified fish mixture derived from the solid wastes of fish processing) is an effective plant fertilizer. This finding offers a possible solution to the recurring problem encountered by fish processors on how to dispose effectively, efficiently, and safely of the solid wastes from fish processing operations. This problem currently limits the restoration, maintenance, or growth of several commercial fishing ports in the Northeast.

We compared fish hydrolysate that was made from Atlantic cod "frames" (what's left after filleting) and that roughly had a 3-5-1 fertilizer value (percent content of nitrogen, phosphorous, and potassium), with a well-known commercial fertilizer with a stated 20-20-20 value. Under controlled but variable conditions of soil type, fertilizer concentration, and fertilization frequency, the fish hydrolysate increased yields in the test crop -- greenhouse jalapeno peppers — by 20 to 123 percent! Contact Burton Tinker, FTS 837-9217 or (617) 281-3600.

MACKEREL SPAWNING MORE CONCENTRATED NORTH OF BORDER

Spawning by Atlantic mackerel was more intense in Canadian waters than in U.S. waters during the 1987 spawning season. That's a preliminary observation resulting from eight egg-and-larval surveys conducted by Center scientists during late spring - early summer as part of a cooperative U.S., Canadian, and Polish effort to estimate the spawning stock biomass of Northwest Atlantic mackerel.

Mackerel egg concentrations were significantly greater in Canadian waters, where densest concentrations occurred west of the Magdalen Islands in the Gulf of St. Lawrence, than in U.S. waters, where densest concentrations occurred off Southern New England. We collected additional data on prespawning adult mackerel (length frequency, weight frequency, age composition, maturity stage, fecundity, etc.) which will be used to assess the stock's status. The stock assessment should be ready by the end of the year. Contact Wallace G. Smith, FTS 342-8260 or (201) 872-0200.

CHRONICALLY LOW OXYGEN REDUCES FLOUNDER FEEDING AND GROWTH

A number of the Northeast's inshore waters have chronically low levels of dissolved oxygen (hypoxia) during the summer months. Accordingly, we have begun to examine the effects of chronic hypoxia on the activity, feeding, and growth of young-of-the-year winter flounder. Initial results show that fish exposed to dissolved oxygen concentrations of 7 (approximately normal for unpolluted waters during the summer), 4, and 2 mg/l for two-week periods continue to feed and grow. However, food consumption and growth rate were significantly less at 2 mg/l. Such reduced growth would at least increase the time spent at smaller and more predatorily vulnerable sizes, and could increase predatory mortality. Contact Allen Bejda, FTS 342-8280 or (201) 872-0200.

TUMOR OCCURRENCE IN BOSTON HARBOR FLOUNDER VARIES BY SEX

We grossly examined 74 large (greater than 12 inches) winter flounder collected from Boston Harbor this past spawning season. Twenty-three percent of the females had tumorous masses in their livers, and an additional 11 percent of the females had nodular masses and discolored areas in their livers which are associated with tumors. We have saved the liver tissue from these specimens for later histological analysis to confirm/deny our gross findings.

Suprisingly, none of the male winter flounder had any sign of liver tumors as a result of gross examination. Male flounder in Boston Harbor at that time of the year may have recently moved into the heavily polluted area from less polluted areas, or female flounder may be more susceptible to tumor development. Additional chemical analysis of liver tissue from both sexes should be revealing. Contact John J. Ziskowski, FTS 642-5200 or (203) 783-4200.

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OCTOBER 1987

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RECENT PUBLICATIONS AND REPORTS

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Contact: Frederick G. Kern

DEMERSAL FINFISH STATUS DOCUMENTED

The Center has prepared a document on the "Status of Mixed Species Demersal Finfish Resources in New England and Scientific Basis for Management." Available upon request, the document reviews in detail the status of the stocks of 10 species being managed under the New England Fishery Management Council's multispecies fishery management plan.

Abundance, fishing mortality, and spawning stock biomass of each stock, as well as total fishing effort for combined species, are reviewed for the 1978-86 period. The document also: (1) discusses the use of spawning stock biomass per recruit levels as targets in the fishery management plan; (2) proposes new target values to account better for uncertainty in the estimating of spawning stock biomass per recruit levels; and (3) evaluates particular management measures as they directly affect current spawning stock biomass levels, and indirectly affect the fishery management plan's goals. Contact Dr. Tim D. Smith, FTS 840-1251 or (617) 548-5123.

NORTHERN SHRIMP LESS ABUNDANT

Abundance of Gulf-of-Maine northern shrimp has declined considerably compared to last year, according to a recent assessment by the Northern Shrimp Technical Committee of the Atlantic States Marine Fisheries Commission. The Committee found both the commercial catch/effort index and the research vessel survey index to be about 30 percent below last year's level.

Effort in the 1987 fishery increased almost 40 percent over 1986, more than tripling since 1983. The large 1982 year class, which mostly supported the fishery during 1986 and 1987, has now passed through the fishery and succeeding year classes are smaller. Consequently, prospects for the upcoming 1988 fishery are not as good as in recent years. Contact Dr. Stephen H. Clark, FTS 840-1312 or (617) 548-5123.

HARD CLAM REPRODUCTIVE SUCCESS REFLECTS WATER QUALITY

Reproductive success of Long Island Sound's hard clams varies by site, perhaps related to pollutant levels of the site's waters. This finding results from a study of clam egg viability at five sites in the Sound. At one of the sites in the western end of the Sound, almost all clam larvae died when held in the site's own waters. When larvae from the site were held in control waters, though, larval survival increased. PCB levels were quite low in clams from all sites. Contact Sheila Stiles, FTS 642-5224 or (203) 783-4224, or Richard Greig, FTS 642-5231 or (203) 783-4231.

SHELLFISH DISEASE DIAGNOSTIC METHODS EVALUATED

In cooperation with the Maryland Department of Natural Resources, the Center has evaluated three methods of diagnosing systematic diseases in shellfish: (1) microscopic examination of live blood cells; (2) microscopic examination of single layers of stained blood cells (i.e., histocytology); and (3) microscopic examination of thin sections of stained bodily tissues (i.e., histology). The evaluation looked at the occurrence of infectious sarcoma disease in softshell clams, and of *Haplosporidium nelsoni* and *Perkinsus marinus* infections in oysters.

Histology was 100 percent accurate (against both false positives and false negatives); histocytology was nearly 100 percent accurate; and live cell study was about 60 percent accurate. The only difference between the histocytologic and

histologic methods was that the former missed early infections of shellfish gills. Contact C. Austin Farley, (301) 226-5193.

TAXONOMY REVISED FOR GAMBA PRAWNS (PSEUDARISTEUS)

A monograph has been published which revises the taxonomy of the wide-ranging gamba prawn genus Pseudaristeus. The monograph recognizes six species, two of which are new to science, and a third which was previously known only in the juvenile stage. Five of the six species have commercial potential. Contact Dr. Isabel Perez-Farfante, (202) 357-1417.

PHYTOPLANKTON MONITORING IMPROVED

The Center has deployed a portable, underway, continuous system for monitoring phytoplankton levels during its MARMAP (marine monitoring, assessment, and prediction) surveys of the Northeast's continental shelf. The system operates unattended for one-and-a-half days and provides both surface-water fluorescence values (i.e. the amount of chlorophyll which represents the amount of phytoplankton) and Loran-C location values every minute. The one-minute sampling interval permits mapping of sea-surface phytoplankton levels with about a 300-meter resolution. Such resolution is twice as good as any of our satellite sensors. Contact Al Matte, FTS 342-8250 or (201) 872-0200.

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J. Brownlow

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts 02543

NOVEMBER 1987

IN THIS ISSUE:

FIFTH SEMIANNUAL STOCK ASSESSMENT WORKSHOP HELD

BOTTOM TRAWL SURVEY PROGRAM MARKS 25TH ANNIVERSARY

FISHERMEN'S REPORT AVAILABLE FOR 1987 AUTUMN BOTTOM TRAWL SURVEY

SIGN UP NOW FOR 1988 SEA-SURFACE TEMPERATURE CHARTS

NEW YORK BIGHT WINTER FLOUNDER MOVE SUPRISINGLY LONG DISTANCES

GADIFORM SECTION UPDATED AND REVISED FOR THE *FISHES OF THE GULF OF MAINE*

The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

FIFTH SEMIANNUAL STOCK ASSESSMENT WORKSHOP HELD

The Center held its fifth semiannual stock assessment workshop in Woods Hole during November 16-20. Workshop participants: (1) reviewed new information on the status of northern shrimp, Gulf-of-Maine Atlantic herring, and bluefish stocks; (2) discussed recent progress and directions of research on black sea bass and estuarine populations of winter flounder; (3) discussed recent research on methods for evaluating availability of *Loligo* squid to the U.S. inshore fishery, and on methods for determining long-term potential catch of surf clams; and (4) reviewed the theory of and methods for estimating spawning stock biomass per recruit--a critical component of the New England Fishery Management Council's multispecies fishery management plan. Contact Dr. Tim D. Smith, FTS 840-1251 or (617) 548-5123.

BOTTOM TRAWL SURVEY PROGRAM MARKS 25TH ANNIVERSARY

The Center has marked the 25th year of its bottom trawl survey program. Since 1963, the program has conducted over 60 surveys of the distribution, abundance, biology, and environment of the Northwest Atlantic's living marine resources. Typical recent surveys take 45-55 days to complete, with work being broken up into two-week segments or "legs." On each leg, Center scientists sample fish and invertebrate populations and collect environmental data at 300-400 prelocated "stations." The resulting samples and data are immediately made available to interested parties after the survey, and are also stored for later detailed research. Contact Thomas R. Azarovitz, FTS 840-1283 or (617) 548-5123.

FISHERMEN'S REPORT AVAILABLE FOR 1987 AUTUMN BOTTOM TRAWL SURVEY

A *Fishermen's Report*, based on the Center's 1987 autumn bottom trawl survey, is available free of charge for the asking. The report lists the composition and size of catches of 23 commercially and recreationally important species at 335 sites between the western Scotian Shelf and Cape Hatteras. The report also includes information on the exact location (latitude & longitude and Loran C bearings), tow direction, time of day, water depth, and bottom temperature of the sampling sites. This autumn's survey was conducted aboard the *Albatross IV* during September 10 - November 6.

The *Fishermen's Report* series is composed of four reports: the spring and autumn bottom trawl survey, the summer surf clam - ocean quahog survey, and the sea scallop survey. Anyone wishing to receive any or all of these reports should write Linda I. Despres-Patanjo, National Marine Fisheries Service, Woods Hole, MA 02543.

SIGN UP NOW FOR 1988 SEA-SURFACE TEMPERATURE CHARTS

Center scientists can now obtain a complete set of the Center's satellite-derived sea-surface temperature charts issued in 1987, and sign up to obtain all 1988 charts as they are issued. Each weekly issue has four charts covering: (1) the Gulf of Maine; (2) southern New England; (3) Connecticut, New York, and northern New Jersey; and (4) southern New Jersey, Delaware, and Maryland. Coverage extends from the coastline to the 1,000-meter depth contour. Temperatures are contoured to reveal thermal fronts. Charts are produced on the first cloud-free day of each week from April through October. (The satellite sensor can't penetrate clouds or fog.)

Although these charts are produced for Center research purposes, the fishing community has also expressed a strong interest in obtaining them on a near real-time basis. To address this interest, the Rhode Island Sea Grant Marine Advisory Service distributes these charts to non-Center users. Center scientists interested in the 1987 and/or 1988 charts should call Carol Fairfield or Margaret Sano, FTS 838-6284. Non-Center users interested in the 1988 charts should contact Ed Richardson, Rhode Island Sea Grant Marine Advisory Service, Marine Resources Building, Narragansett Bay Campus, Narragansett, RI 02882, or call (401) 792-6211.

NEW YORK BIGHT WINTER FLOUNDER MOVE SUPRISINGLY LONG DISTANCES

Last January, we highlighted our tagging study of winter flounder in the New York Bight which is designed to determine the species' movements within and around the 12-Mile Dumpsite in the Bight. The dumpsite is being phased out as New York City's major site for sewage sludge disposal. The tagging study is part of our overall study of the dumpsite's ability to recover to a safe and productive fisheries habitat.

Previous studies of winter flounder concluded that those fish found south of Cape Cod have relatively short-distance movements between their inshore spawning areas during the winter and their offshore areas during the other seasons. The tag returns from our current study generally support these earlier findings of only short-distance movements, with most of the tagged specimens being recaptured along New Jersey and western Long Island. Some recent recaptures, however, have shown some suprisingly long-distance movements, occurring at Shinnecock Inlet (eastern Long Island), Montauk Point (eastern Long Island), Nantucket Island, and Georges Bank.

During the upcoming winter, spawning flounders will return inshore where fishing effort is more concentrated, tag returns should increase, and we should obtain more data on the long-distance/short-distance movement question. Contact Beth Valdes, FTS 342-8279 or (201) 872-0200.

GADIFORM SECTION UPDATED AND REVISED FOR *FISHES OF THE GULF OF MAINE*

The gadiform (cod-like fishes) section of Henry Bigelow and William Schroeder's classic book on the *Fishes of the Gulf of Maine* has now been updated and revised. When the remaining sections have been dealt with, the book will be republished. Population and fisheries information in the republication will come from the Center's annual report on the *Status of the Fishery Resources Off the Northeastern United States*.

Bigelow and Schroeder's work, which was published in 1953 as part of the *Fishery Bulletin* series, was itself a revision of an earlier work by Bigelow and William Welsh in 1925. The 1953 edition is still a useful reference, but changes in scientific and common names, new information on organism-level biology (particularly early life history and food habits), and changes in populations and fisheries necessitate the updating and revising. Contact Dr. Bruce B. Collette, (202) 357-2524.

J. Brown Lee

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
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Northeast Fisheries Center
Woods Hole, Massachusetts 02543

DECEMBER 1987

IN THIS ISSUE:

MACKEREL BIOMASS ESTIMATED BY EGG SURVEYS

TAGGED U.S. SALMON RECOVERED IN GREENLAND

PREDATION SIGNIFICANTLY LIMITS CLAM PRODUCTION

The Northeast Fisheries Center's *Monthly Highlights* is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

MACKEREL BIOMASS ESTIMATED BY EGG SURVEYS

In the September issue of *Monthly Highlights*, we noted how spawning by Northwest Atlantic mackerel was more intense in Canadian waters than in U.S. waters during the 1987 spawning season. That preliminary observation came from eight egg surveys conducted by Center scientists during late spring - early summer as part of a cooperative U.S., Canadian, and Polish effort to estimate adult spawning biomass of Northwest Atlantic mackerel.

Detailed analysis of the surveys' samples and data shows that spawners in Canadian waters accounted for 89 percent of the adult spawning biomass; spawners in U.S. waters accounted for 11 percent. The Center's estimate of 1987 adult spawning biomass--based on these egg surveys--is 1.10 million metric tons (2.47 billion pounds). This estimate compares very favorably with estimates based on virtual population analysis.

Northwest Atlantic mackerel total stock biomass, as estimated by virtual population analysis, has fluctuated widely over the past 25 years. (Estimates of *total stock* biomass will always be somewhat larger than estimates of *adult spawning* biomass since the former includes all age 1 and older fish, whereas the latter includes hardly any age 1, a variable proportion of age 2, and almost all age 3 and older fish.) Total stock biomass increased from 0.30 million metric tons (0.67 billion pounds) in 1962-65 to 1.9 million metric tons (4.26 billion pounds) in 1970-71, decreased to an average of 0.49 million metric tons (1.09 billion pounds) in 1977-81, and increased to 1.50 million metric tons (3.36 billion pounds) in 1986.

Contact Wallace G. Smith, FTS 342-8260 or (201) 872-0200.

TAGGED U.S. SALMON RECOVERED IN GREENLAND

Center scientists, in cooperation with their Canadian and Danish counterparts, detected 146 coded-wire-tagged Atlantic salmon among over 25,000 salmon examined at four West Greenland fishing ports during August and September. Of the 146 tagged fish, 82 were of U.S. origin, 19 of Canadian origin, and the rest of European origin (mostly England, Wales, and Ireland). Of the U.S.-origin tagged fish, 77, or 94 percent, were from Maine rivers. These tag recoveries are particularly significant because they represent the first year in which coded-wire-tagged salmon of Maine origin have been available to the West Greenland fishery.

Scientists examined the salmon after the fish had been bought by fish processors, but before the fish had been flash frozen and glazed. Scientists used special metal detectors to identify which salmon had the magnetically coded, one-millimeter-long wire tags imbedded in their skulls. These coded-wire tags, which are indetectable by fishermen and thus necessitate the special samplng by scientists, are now in common use by the salmon-producing countries of the North Atlantic. The United States began applying these tags to one-year-old salmon ("smolts") in 1985.

Contact Dr. Kevin D. Friedland, FTS 840-1369 or (617) 548-5123.

PREDATION SIGNIFICANTLY LIMITING CLAM PRODUCTION

Predation substantially limits the production of hard clams in Great South and Barnegat Bays, the largest clam production areas in New York and New Jersey, respectively. These findings come from separate field studies of these areas by Center scientists, supplemented by laboratory experiments also conducted by the Center.

We conducted the Barnegat Bay field study in conjunction with a cooperative effort to create hard clam spawning sanctuaries throughout the Bay. At each of five study sites, we planted paint-marked juvenile (five-millimeter long) clams around stakes. At four of the five sites, there was at least 62 percent mortality of marked clams within 70 days, with most of it due to crab predation, although at one of those four sites, almost half of the predation was due to oyster drills. In the most extreme case, 96 percent of the marked clams at one site were crushed after four days, indicating crab predation.

In the Great South Bay field study, we used a SCUBA-deployed hydraulic suction sampler to collect clams at four sites in August 1986, and at six sites in August 1987. This two-year effort permitted us to follow the mortality and growth of the Bay's strong 1985 "set" of clams. Between 1986 and 1987, the average density of these clams decreased from ten to three per square yard. We attribute the mortality largely to predation, mostly by crabs. (Incidentally, in 1987, when the 1985-set clams were 5-20 millimeters long, we found no other abundant size classes less than 40 millimeters long. Consequently, clam harvests in the Bay should decrease for two or more years until the 1985-set clams grow to a commercial size.)

We also ran a laboratory experiment to evaluate the predation potential of sand shrimp and grass shrimp--which are often abundant on clam beds--on early-stage juvenile hard clams. Individual shrimp were placed in dishes which held 50 one-millimeter-long clams. In every case, all clams were consumed in 24 hours.

The results of the field studies and laboratory experiments show the importance of predation in limiting hard clam production in the New York - New Jersey area. Contact Clyde MacKenzie, Jr., FTS 342-8200 or (201) 872-0200.

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JANUARY 1988

IN THIS ISSUE:

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TOXIC MACKEREL LIVERS IMPLICATED IN WHALE DEATHS

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RECENT PUBLICATIONS AND REPORTS

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

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STATUS-OF-THE-STOCKS REPORT RELEASED

The Center has published the "Status of the Fishery Resources Off the Northeastern United States for 1987" as NOAA Technical Memorandum NMFS-F/NEC-50. The 132-page report summarizes the current and projected status of 36 Northwest Atlantic species, representing 45 exploited stocks. The report also reviews current information on commercial and recreational fisheries, and economically evaluates commercial fisheries through 1986.

All 800 copies of the first printing have been distributed. A limited number of the second and final printing of 600 copies will be available for free distribution on a first-come, first-served basis. Contact Dr. Tim D. Smith, FTS 840-1251 or (617) 548-5123.

GEORGES BANK TREATISE PUBLISHED

The MIT Press has published a treatise on Georges Bank. The book is both an atlas and a comprehensive and rigorous synthesis of knowledge on the geology, physical oceanography, chemistry, and biology of Georges Bank, as well as on the principal social, economic, and political issues involved in use of the Bank's resources. Of the 57 technical chapters, more than half deal with biology, including fisheries, and many of these were authored by Center scientists or persons supported by Center or Sea Grant funding. Included in the book is up-to-date information on the capacity for fish production, the natural processes that control fish production, and the effects of exploitation on fish production. In addition to a comprehensive summary of all NOAA/NMFS studies of the Bank, it also presents results from major studies funded by the Bureau of Land Management and Minerals Management Service, including the New England OCS Environmental Benchmark Program, New England OCS Physical Oceanography Program, Georges Bank Monitoring Program, and Sediment Transport Program.

The purchase cost of the book is high (i.e., 225 dollars); however, limited numbers of reprints of individual chapters are available from senior authors. A list of chapters, authors, and authors' mailing addresses is available by writing to: Information Services Section, Northeast Fisheries Center, Woods Hole, MA 02543. Contact Dr. Marvin D. Grosslein, FTS 840-1252 or (617) 548-5123.

TOXIC MACKEREL LIVERS IMPLICATED IN WHALE DEATHS

In response to the known deaths of 14 humpback, 4 minke, and 2 fin whales along the New England coast in December and January, the Center began testing the toxicity of liver extracts from several fish species known to be prey--as juveniles or adults--of whales. On December 18, we found liver extracts from Atlantic mackerel to be toxic to laboratory test mice. Subsequent evidence gathered by the Center and other organizations has now implicated the consumption of mackerel containing paralytic shellfish toxins in the whale deaths.

Relatively low levels of toxicity were found in all mackerel liver extracts from samples collected within the western Atlantic range of this species (i.e., from Northumberland Strait in the Gulf of St. Lawrence to the Mid-Atlantic region). Mean toxicity levels were 185 micrograms of toxin per 100 grams of liver, with up to 446 ug/100 g present in some samples. Interestingly, we found toxicity levels of 60 ug/100 g in liver extract from mackerel collected off Nantucket Island as long ago as

April 1986. It is emphasized, however, that there is no danger to human consumption of mackerel as no toxicity has been detected in the muscle tissue, the edible portion.

No toxicity has been detected in the livers of other whale prey species such as Atlantic herring and silver hake (whiting), nor in the livers of goosefish (monkfish). Stomach contents of one whale--consisting mostly of bones--were tested and found to be only mildly toxic, causing delayed death of mice. Contact Ronald C. Lundstrom, FTS 837-9277 or (617) 281-3600.

12-MILE DUMPSITE BASELINE NOW ESTABLISHED

The Center has now completed the first year and a half of sampling at the New York Bight's 12-Mile Dumpsite. The sampling to date has been designed to establish a baseline for determining the effects--primarily biological--of ending sewage-sludge dumping at the site. (The last dumping was in December 1987.)

With a year and a half of sampling completed, we can now begin to compare any seasonal trends. During the November survey of three stations, chosen to represent impacted, enriched, and less polluted habitats, some trends persisted from autumn 1986 to autumn 1987. The dominant bottom fishes were little skate (75 percent of the weight per tow in 1986; 50 percent in 1987) and winter flounder (19 percent in 1986; 15 percent in 1987). At the "impacted" station, the average weight per tow for all bottom fishes increased from 22 to 40 pounds. The dominant crustaceans were rock and horseshoe crabs which ranked first and second, respectively, in weight per tow for both 1986 and 1987. At all three stations though, the weight per tow decreased for both species between the two years.

It should be noted, at this point in time, that these early comparisons do not statistically indicate that any rapid, significant shift from crustaceans to fishes has occurred. Continued sampling will be necessary to determine if any changes in the biological community in and around the site are related to the ending of sewage-sludge dumping. Contact Stuart J. Wilk, FTS 342-8290 or (201) 872-0200.

STATUS OF STRIPED BASS RECOVERY/RESEARCH REVIEWED

Surveys have revealed a record high abundance of juvenile striped bass in the Hudson River and in the Virginia tributaries to Chesapeake Bay. Juvenile abundance remains very low, however, for the Roanoke River and the Maryland tributaries to Chesapeake Bay. These findings were reported at the annual Striped Bass Workshop (sponsored by the National Marine Fisheries Service and the U.S. Fish and Wildlife Service) held in Norfolk, Virginia, on January 5 and 6.

The workshop also addressed recent research which suggests that stripers are maturing at later ages than previously thought, and that sex-specific migration rates from Chesapeake Bay differ from those historically observed. The ongoing tagging program for Atlantic Coast stripers resulted in 18,000 fish being tagged and released last year. Tag returns should increase this year as fish from the 1982 year class begin attaining the minimum size for possession. Contact Dr. R. Anne Richards, FTS 840-1357 or (617) 548-5123.

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Reprints of publications and copies of reports are available by writing to the senior Center author (names in all capital letters are Center authors) care of: Information Services Section, Northeast Fisheries Center, Woods Hole, MA 02543.

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NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts 02543

FEBRUARY 1988

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REPORT ISSUED FOR STOCK ASSESSMENT WORKSHOP

RECOMMENDATIONS MADE TO IMPROVE WATER QUALITY IN THE HUDSON-RARITAN ESTUARY

ANNOTATED LIST OF MASSACHUSETTS BAY FISHES NOW AVAILABLE

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

REPORT ISSUED FOR STOCK ASSESSMENT WORKSHOP

The Center has issued a "Report of the Fifth NEFC Stock Assessment Workshop (Fifth SAW)" as Woods Hole Laboratory Reference Document No. 87-12. The fifth SAW, held during November 16-20, 1987, in Woods Hole, Massachusetts, reviewed the status of several economically valuable stocks of fishes and invertebrates in the New England and Mid-Atlantic regions. The workshop report, available upon request, includes technical reviews of presentations made on: (1) an updated assessment of northern shrimp; (2) revised assessments of Atlantic herring and bluefish; (3) approaches to assessment of black sea bass; (4) long-term potential catch of surf clams and ocean quahogs; (5) availability of Loligo squid; and (6) review of the concept and statistical attributes of "spawning stock biomass per recruit." The next Stock Assessment Workshop is scheduled for May 3-5, 1988. Contact Dr. Tim D. Smith, FTS 840-1251 or (617) 548-5123.

RECOMMENDATIONS MADE TO IMPROVE WATER QUALITY IN THE HUDSON-RARITAN ESTUARY

Center scientists, along with representatives of other federal, state, and interstate agencies, academia, and industry, have prepared a report on water quality of the Hudson-Raritan Estuary. The report, entitled "The Hudson-Raritan: State of the Estuary," presents the consensus of its preparers on conditions and trends in water quality, including nutrients, toxic materials, indicators of (human) disease-causing organisms, floating wastes and debris, oxygen-consuming materials, biota, and diseases of those biota. The report also presents recommendations to improve water quality, including: (1) designating the estuary as part of the EPA's National Estuary Program; (2) strictly enforcing existing laws and regulations on contaminant discharge and physical loss of habitat; (3) addressing non-point pollution from a regionwide standpoint; (4) tightening requirements for pretreatment of wastes by industry; (5) regulating additional pollutants and pollutant sources; (6) placing more emphasis on land-air-sea interactions in waste treatment and pollution control; and (7) preparing the public for the possible need to curtail use of nondegradable products.

The report comes in two volumes. Volume I, a summary report, is available for 15 dollars. Volume II, an appendix of full papers, will soon be available for 28 dollars. Orders should be placed with the New Jersey Marine Sciences Consortium, Bldg. 22, Ft. Hancock, NJ 07732. Contact Robert N. Reid, FTS 342-8220 or (201) 872-0200.

ANNOTATED LIST OF MASSACHUSETTS BAY FISHES NOW AVAILABLE

One-hundred years after the appearance of the first comprehensive list of Massachusetts Bay fishes, the Center has issued a new list. Entitled "An Annotated List of the Fishes of Massachusetts Bay," the list includes 141 species in 68 families based on authoritative literature reports and museum specimens. First records for Massachusetts Bay are recorded for Atlantic angel shark, smooth skate, wolf eelpout, lined seahorse, rough scad, and smallmouth flounder.

The report has been issued as NOAA Technical Memorandum NMFS-F/NEC-51. Limited copies are available on a first-come, first-served basis. Contact Dr. Bruce B. Collette, FTS 357-2552 or (202) 357-2552.

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NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

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MARCH 1988

IN THIS ISSUE:

MARINE RECREATIONAL FISHING TO CONTINUE EXPANSION IN NORTHEAST

REPORT RELEASED ON WATER MASSES RECEIVING WASTES AT THE 106-MILE DUMPSITE DURING FISCAL YEAR 1987

LOBSTER TAGGING PROGRAM BEGUN AT 12-MILE DUMPSITE

SLOWED GROWTH IN HARD CLAMS ATTRIBUTED TO ALGAL BLOOMS

BOTTOM TRAWL SURVEY EVALUATION REPORT COMPLETED

ABSTRACTS AVAILABLE FOR CENTER'S ANNUAL SHELLFISH BIOLOGY SEMINAR

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

MARINE RECREATIONAL FISHING TO CONTINUE EXPANSION IN NORTHEAST

The Northeast's marine anglers will increase in numbers by at least 34 percent by the year 2025, bringing the total to nearly five million anglers. That's the prediction of Center scientists as presented in a talk at the Symposium on Demand and Supply of Sport Fishing, held in Charleston, South Carolina, during March 14-15. The predicted increase comes on the heels of a 200 percent increase in the past three decades.

The model used by Center scientists to make these predictions relies on projections of population size and the closeness of the population to the shoreline. Our future research will extend our predictions to include specific fisheries (e.g., bluefish, summer flounder) and fishing modes (e.g., charter boat fishing, shore fishing). Contact Dr. Steven F. Edwards, FTS 840-1364 or (617) 548-5123.

REPORT RELEASED ON WATER MASSES RECEIVING WASTES AT THE 106-MILE DUMPSITE DURING FISCAL YEAR 1987

A report on the surface water masses at the 106-Mile Dumpsite that received industrial chemical wastes or sewage sludge during Fiscal Year 1987 (October 1986 - September 1987) has been prepared and released by the Center. Surface water masses which occurred at the site were those originating: (1) on the continental shelf ("shelf water"); (2) on the continental slope ("slope water"); and (3) from the Gulf Stream and one or more of its cutoff meanders ("warm-core rings"). During Fiscal Year 1987, 11 million gallons (79 percent) of industrial chemical wastes were dumped into slope water, three million (21 percent) into warm-core ring/Gulf Stream water, and none into shelf water. During the same period, 467 million gallons (62 percent) of sewage sludge were dumped into slope water, 260 million (34 percent) into warm-core ring water, and 29 million (four percent) into shelf water.

This report is the 12th in an annual series. Copies of any of these reports can be obtained by writing: Marine Climatology Investigation, National Marine Fisheries Service, South Ferry Road, Narragansett, RI 02882. Contact LTJG Margaret Sano, FTS 838-6284 or (401) 792-6837.

LOBSTER TAGGING PROGRAM BEGUN AT 12-MILE DUMPSITE

Center scientists have begun a 2-3 year tagging program with lobsters from the 12-Mile Dumpsite in the New York Bight apex. The Dumpsite has recently been closed and marine resource and environmental managers are watching for signs of recovery of the site's fisheries habitats. The recapture of lobsters that have been tagged and released in and around the Dumpsite should provide such information by detecting any changes in the direction and rate of lobster movements, as well as in the incidence and severity of lobster exoskeleton (shell) diseases.

Lobsters are being tagged with 1 1/2-inch long, pink or yellow-colored "spaghetti" tags which offer a reward. The reward is three dollars plus the landed value of the lobster, and can be claimed by returning the tagged lobster to a NMFS port agent or the Center's Sandy Hook Laboratory in Highlands, New Jersey. "Short" (legally undersized) lobsters will be tagged, and possession of "shorts" by fishermen will be permitted provided that the tag remains in the lobster <u>and</u> it is promptly returned to a NMFS port agent. Contact Judy Rugg, FTS 342-8216 or (201) 872-0200.

SLOWED GROWTH IN HARD CLAMS ATTRIBUTED TO ALGAL BLOOMS

Center studies of caged hard clams in Long Island Sound have shown a sharp decline in growth rate at those sites experiencing blooms of an unidentified Prorocentrum sp. alga. We monitored clam growth last year at three sites in the Sound--off Greenwich, Milford, and Stonington, Connecticut--which represent the range of estuarine to coastal habitats found within the Sound. Although all three sites had an optimal range of seawater temperatures and an abundant level of phytoplanktonic food, only the Stonington site showed clam growth linked--as would be expected--to water temperature. At the Greenwich and Milford sites, clam growth significantly slowed in close correspondence to the occurrence of blooms by the Prorocentrum sp. From these findings, we feel that Prorocentrum sp. blooms interfere with hard clam growth, and speculate that such interference comes from a metabolite of the alga, or from physical damage to the clam digestive system by the sharp "tooth" on the Prorocentrum sp.'s cell wall. Contact Ronald Goldberg, FTS 642-5246 or (203) 783-4246, or Gary Wikfors, FTS 642-5225 or (203) 783-4225.

BOTTOM TRAWL SURVEY EVALUATION REPORT COMPLETED

A report, titled "An Evaluation of the Bottom Trawl Survey Program of the Northeast Fisheries Center," has been issued as NOAA Technical Memorandum NMFS-F/NEC-52. Included in the report is an in-depth review of the procedures of the Center's bottom trawl surveys, levels of precision being achieved in these surveys, and techniques and options for improving survey precision and efficiency. Special emphasis was placed on the use of time-series analysis techniques for improving the stock abundance indices which are derived from the survey data. Contact Dr. Stephen F. Clark, FTS 840-1312 or (617) 548-5123, or Dr. Michael J. Fogarty, FTS 840-1255 or (617) 548-5123.

ABSTRACTS AVAILABLE FOR CENTER'S ANNUAL SHELLFISH BIOLOGY SEMINAR

The Center held its annual Shellfish Biology Seminar in Milford, Connecticut, on March 2. This year's seminar emphasized the results of the Center's ongoing shellfish recruitment studies in Long Island Sound, as well as the results of similar studies being conducted by other scientists in other coastal states. Abstracts of the 16 papers and one poster are available upon request. Contact Dr. Walter Blogoslawski, FTS 642-5235 or (203) 783-4235.

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APRIL 1988

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The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

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Contact: Frederick G. Kern

DUMPING DIVERTED TO SAVE LOBSTER FISHERY

The Center has worked with the U.S. Environmental Protection Agency to modify a proposed ocean dumping operation to save part of a lobster fishery. About 400,000 cubic yards of sand and mud are scheduled to be dumped at the New York Bight's Cellar Dirt Dumpsite which is located eight miles off Sandy Hook, New Jersey. The dumpsite has long received rubble from building demolitions and excavations which has provided a protective habitat for lobsters and supported a pot fishery for them. The proposed dumping of sand and mud, though, could smother the habitat and damage the pots. As a result of the Center's interviewing of local fishermen to determine the best habitat/fishing areas within the dumpsite (the eastern half), and then providing that information to the EPA (which regulates the dumpsite), the EPA has restricted the proposed sand and mud dumping to the less productive northwestern quadrant of the site. Contact Clyde MacKenzie, FTS 342-8200 or (201) 872-0200.

"FISHERMEN'S REPORT" FOR SPRING BOTTOM TRAWL SURVEY AVAILABLE

A "Fishermen's Report" is now available upon request which lists the results of the Center's spring bottom trawl survey. The survey sampled 321 sites between Nova Scotia and North Carolina during March 4 through April 21. The report lists the sampling location, sampling time, towing direction, bottom depth and temperature, and species by weight caught at each site.

A synoptic view of the survey results shows samples dominated by: pollock, white hake, and Acadian redfish in the Gulf of Maine; winter skate and Atlantic cod on Georges Bank; spiny dogfish, little skate, and Atlantic mackerel off Southern New England and the Mid-Atlantic; and longfin squid along the continental shelf margin. Contact Thomas R. Azarovitz, FTS 840-1283 or (617) 548-5123.

SHARK TAGGING PROGRAM'S 1987 RESULTS SUMMARIZED

The NMFS Cooperative Shark Tagging Program has released its summary report of 1987 activities. (Report distribution is limited to program participants.) During 1987, the program sponsored and directed the tagging of about 6,000 sharks representing more than 40 species. More than 200 tags were returned from about 20 species. Anglers, U.S. Foreign Fisheries Observers, U.S. and foreign commercial fishermen, and biologists volunteered their efforts in these tagging and recapture activities.

Records were set last year for: (1) time at liberty (sandbar - 21.8 years, dusky - 11.8 years, hammerhead - 9.6 years, and blacktip - 7.3 years); (2) distance travelled (night - 1400 miles and scalloped hammerhead - 765 miles); and (3) rate of travel (tiger - 15.1 miles per day). In addition to migration and movement information, tag returns provided valuable information on longevity, growth rate, seasonal distribution, etc. The report also summarizes results of other Center research on sharks and other apex predators. Contact John G. Casey, FTS 838-6320 or (401) 782-3320.

SAND LANCE DISTRIBUTION AND ABUNDANCE DOCUMENTED

As part of our research on sand lance, the Center and cooperating scientists at the University of Massachusetts-Amherst have prepared a report--available upon request--on the historical distribution and abundance of this species in the Northeast. Sand lance are an important component of the Northeast Shelf Ecosystem,

primarily as food for such species as Atlantic cod, bluefish, humpback and fin whales, and numerous marine birds. Objectives of the new project are to assess the population status of this species, with an emphasis on growth rate, longevity, maturity, fecundity, and mortality rates. Contact Gary A. Nelson, FTS 840-1374 or (617) 548-5123.

RECENT PUBLICATIONS AND REPORTS

Reprints of publications and copies of reports are available in limited numbers on a first-come, first-served basis by writing to the senior Center author (names in all capital letters are Center authors) care of: Information Services Section, Northeast Fisheries Center, Woods Hole, MA 02543.

BARTON, K. W. 1988. Report of water masses receiving wastes from ocean dumping at the 106-mile Dumpsite, October 1, 1986, through September 30, 1987. Mar. Climatol. Invest. Data Anal. Prod. No. 24. 14 p.

Botton, M. L., and J. W. ROPES. 1987. Populations of horseshoe crabs, Limulus polyphemus, on the northwestern Atlantic continental shelf. Fish. Bull., U.S. 85(4): 805-812.

COLLETTE, B. B., and K. E. Hartel. 1988. An annotated list of the fishes of Massachusetts Bay. NOAA Tech. Mem. NMFS-F/NEC-51. 70 p.

Report of the Fifth NEFC Stock Assessment Workshop ("Fifth SAW"). Woods Hole Lab. Ref. Doc. No. 87-12. 66 p.

SURVEY WORKING GROUP, NORTHEAST FISHERIES CENTER. 1988. An evaluation of the bottom trawl survey program of the Northeast Fisheries Center. NOAA Tech. Mem. NMFS-F/NEC-52. 83 p.

NORTHEAST FISHERIES CENTER

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IN THIS ISSUE:

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CENTER-SUPPORTED RESEARCH TO IMPROVE MARINE MAMMAL ASSESSMENT

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FLOUNDER TAG RETURNS SUPPORT PREVIOUS MOVEMENT & MIGRATION FINDINGS

SYSTEMATICS LABORATORY ANNUAL REPORT AVAILABLE

MOROCCAN FISHERIES RESEARCH AIDED

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STRIPER STATUS REPORTED TO CONGRESS

Scientists from both the Northeast Fisheries Center and the U.S. Fish and Wildlife Service recently summarized the findings of the federal Emergency Striped Bass Study (ESBS) at hearings of the U.S. Senate and House of Representatives. The ESBS, begun by Congress in 1980 to determine the causes of striper declines and to monitor the status of striper stocks, is scheduled to expire on September 30 unless Congress reauthorizes the study's parent act--the Atlantic Striped Bass Conservation Act.

The scientists reported some signs of recovery of the Chesapeake stock in recent years. Abundance of juveniles and young adults has been increasing. Excellent juvenile production occurred in the lower Bay in 1987. Juvenile production remains poor, though, in many other areas of the Bay that have historically been important to this stock. Contact Dr. R. Anne Richards, FTS 840-1357 or (617) 548-5123.

CENTER-SUPPORTED RESEARCH TO IMPROVE MARINE MAMMAL ASSESSMENT

The Northeast Fisheries Center has and continues to support research on the use of individual identification techniques to study the population dynamics of the Northwest Atlantic's humpback and right whales. Results of this Center-supported research were presented at a recent workshop held by the International Whaling Commission's Scientific Committee which dealt with the use of photographic identification techniques to study the population dynamics of the large whales. The Scientific Committee is preparing a comprehensive assessment of whale stocks and feels that the individual identification techniques are now adequately developed to play a major role in its assessment work.

At the workshop, which was held in San Diego during April 30 - May 4, results of other Center-supported research were presented dealing with the relative effectiveness of using one or two teams of spotters in line-transect surveys of the Northwest Atlantic's harbor porpoise populations. The double-team approach may be useful in testing the effectiveness of the single-team approach currently used by the Scientific Committee in its assessment of several whale stocks. Contact Dr. Tim D. Smith, FTS 840-1251 or (617) 548-5123.

LOBSTER IDENTIFICATION GUIDE TO BE REVISED AND COMMERCIALLY PUBLISHED

A Center publication on "Lobsters--Identification, World Distribution, and U.S. Trade" which originally appeared in Marine Fisheries Review (Volume 48, Issue 2) will be revised to make it more useful to non-scientific readers. The revision, now nearly completed, will include larger type, more use of common names, pictures of whole lobsters, distribution maps of individual species, and a species check list. Anyone interested in obtaining the revised publication should contact the commercial publisher: Ian Dore, P.O. Box 965, Huntington, NY 11743; (516) 549-0143.

FLOUNDER TAG RETURNS SUPPORT PREVIOUS MOVEMENT & MIGRATION FINDINGS

Recent tag returns from winter flounder originally tagged by the Center in the vicinity of the New York Bight's 12-Mile Dumpsite continue to show that this species in this area has localized movements and seasonal migrations. The tagging program is a part of an overall Center program to study the dumpsite's ability to

recover to a safe and productive fisheries habitat now that it has been closed as New York City's major site for dumping sewage sludge.

Of those flounder originally captured, tagged, and released in inshore waters, 35 were recaptured this year: 25 that were at liberty less than one month and were recaptured within 2.5 miles of their release sites, and 10 that were at liberty for one year and were also recaptured near their release sites. These recaptures indicate that some, if not most, of the flounder return to the same estuary year after year to spawn. Of those flounder originally captured, tagged, and released during this past winter offshore at the dumpsite, eight were recaptured this spring: five in inshore Long Island waters, and three in inshore Sandy Hook-Raritan Bay waters. These recaptures support the pattern of offshore-inshore migrations during late winter-early spring.

Two additional tag returns from Long Island waters were from flounder originally tagged in New Jersey waters, supporting the concept of population intermixing between estuarine systems. Contact Beth Valdes, FTS 342-8279 or (201) 872-0200.

SYSTEMATICS LABORATORY ANNUAL REPORT AVAILABLE

The National Systematics Laboratory's 1987 annual report is available in limited numbers upon a first-come, first-served basis. The report covers the research, services, and publications by the Laboratory in 1987 dealing with fish, squid, crustacean, and coral taxonomy. Contact Dr. Bruce B. Collette, FTS 357-2552 or (202) 357-2552.

MOROCCAN FISHERIES RESEARCH AIDED

Center personnel visited the Marine Fisheries Institute in Casablanca, Morocco, during April 10 - May 1 to complete the second phase of a three-phase program to improve the survey, assessment, and management of Moroccan fisheries resources. The program is sponsored by the U.S. Agency for International Development.

Phase I, which occurred during July 24, 1987, to February 15, 1988, involved both a visit to Morocco by Center personnel to evaluate the Moroccan trawl survey program and assess Moroccan training and equipment needs, and a visit to the United States by a Moroccan scientist to become exposed to the Center's trawl survey program. Phase II emphasized the standardization and documentation of current Moroccan survey methods, and the design of future Moroccan survey programs. Phase III will include training in analysis and reporting of survey data. Contact Linda I. Despres-Patanjo, FTS 840-1346 or (617) 548-5123.

NORTHEAST FISHERIES CENTER

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IN THIS ISSUE:

STUDY IDENTIFIES POTENTIAL FOR FISH PRODUCTION AND FISHERIES YIELDS

ILLUSTRATED KEY TO AMERICAN PENAEOID SHRIMP PUBLISHED

SAND MINING EFFECTS TO BE PREDICTED/DETERMINED

OCEANOGRAPHIC CONDITIONS OF NORTHWEST ATLANTIC DOCUMENTED

BRIEFS

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

STUDY IDENTIFIES POTENTIAL FOR FISH PRODUCTION AND FISHERIES YIELDS

A just-published Center study of the Northeast Continental Shelf Ecosystem concludes that the ecosystem annually produces eight million metric tons of fish biomass which can yield a 1-2 million metric ton harvest. Entitled "The Continental Shelf Ecosystem off the Northeast Coast of the United States," the study describes the physical environment and how its seasonal cycles affect the biomass, production, and community dynamics of phytoplankton, zooplankton, benthos, and fish from the Bay of Fundy to Cape Hatteras.

The study also highlights the relationships between changes in the ecosystem's natural production and changes in its fisheries yields during the past two decades. Reprints are available but in limited numbers. Contact Dr. Kenneth Sherman, FTS 838-6210 or (401) 782-3210.

ILLUSTRATED KEY TO AMERICAN PENAEOID SHRIMP PUBLISHED

An "Illustrated Key to Penaeoid Shrimps of Commerce in the Americas" has just been published. Prior to this key, it was difficult to identify some of the 37 commercially valuable penaeoid shrimps (19 from the Atlantic and 18 from the Pacific) of the western Atlantic and eastern Pacific.

The key is based on readily recognizable characters and is accompanied by detailed illustrations. Each species description is composed of the scientific and most common vernacular names, the geographic and bathymetric ranges, and the maximum length attained by each sex. Contact Dr. Isabel Perez Farfante, FTS/(202) 357-1417.

SAND MINING EFFECTS TO BE PREDICTED/DETERMINED

We are working with our Northeast Region and with other federal and state agencies to predict and determine effects of a sand mining and beach nourishment project between Sandy Hook and Manasquan, New Jersey, to begin in 1990. In the project the U. S. Army Corps of Engineers would direct the hydraulic mining of 17.8 million cubic yards of sand from nearshore areas, and the delivery of it to beaches via pipelines.

The Center's role has been and will be to give advice on: (1) baseline conditions of the resources and habitats against which any changes can be detected; (2) the monitoring program to determine the causes and effects of any changes; and (3) recreational and commercial fishing areas in general, and surf clam and American lobster resources in particular. Contact Robert N. Reid, FTS 342-8220 or (201) 872-0200.

OCEANOGRAPHIC CONDITIONS OF NORTHWEST ATLANTIC DOCUMENTED

Three reports are available on oceanographic conditions in the Northwest Atlantic in 1987. Covered in the reports are: (1) the water-column temperatures along a transect through the New York Bight; (2) the position and variability of the front between the continental shelf water mass and the continental slope water mass; and (3) the paths and rates of movement of warm-core rings generated by the Gulf Stream. Contact Reed S. Armstrong, FTS 838-6280 or (401) 782-3280.

BRIEFS

Following is a list of research projects to be highlighted when results and their implications/applications become available:

--reproductive success of Long Island Sound lobsters being measured

--liquified wastes from fish processing plants being tested as cranberry fertilizer

--spatial correlation concept being used to analyze resource survey data

--mathematical models being developed to evaluate/interrelate population dynamics of Atlantic mackerel, Atlantic herring, and sand lances

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JULY 1988

IN THIS ISSUE:

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RECENT PUBLICATIONS & REPORTS

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Environmental Processes Division Chief.....Dr. Robert A. Murchelano
National Systematics Laboratory Director.....Dr. Bruce B. Collette
Research Planning & Coordination Staff Chief (Acting).....Dr. John G. Boreman, Jr.
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Program Support Staff Chief.....Mary G. Laird

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Contact: Frederick G. Kern

SHELLS DEPLOYED TO REDUCE PREDATION ON JUVENILE HARD CLAMS

As noted in the December 1987 issue of Monthly Highlights, Center studies have shown that predation (particularly by crabs and other crustaceans) upon juveniles (or spat) is a major limiting factor in hard clam production. There is some evidence that juveniles are less vulnerable to such predation when they set in beds of shells or similar material. Consequently, Center scientists are now measuring the settlement of, and predation upon, hard clams in shell beds set out in Barnegat Bay, New Jersey, and comparing these findings with those from nearby sites without shells.

New Jersey Sea Grant has been interested in the technique and plans to work with us in testing effects of large shell beds (i.e., greater than one acre) on hard clam production in Barnegat Bay. Also, at the request of the Town of Islip (Long Island), New York, we are providing the town with shells to test effects in Great South Bay. From 300,000 to 500,000 bushels of broken surf clam and ocean quahog shells are produced annually in New Jersey, much of which is currently discarded or used as roadfill. Many of these shells could be recycled and used as cover for juvenile hard clams, if our tests prove successful. Contact Clyde L. MacKenzie, FTS 342-8267 or (201) 872-0200.

SQUIDS & OTHER CEPHALOPODS UNDERGO SYSTEMATIC REVISION

The Center led a working group on systematic revision of the squid family Loliginidae as part of the International Workshop on the Systematics and Biogeography of Cephalopods held in Washington, D.C., during July 11-25. The working group agreed upon a new genus-level classification for the 42 species of loliginids now recognized in the world. (The dominant species in the Northeast's squid fishery, the long-finned squid, is a loliginid.)

Six other working groups each focused on an important cephalopod family in need of systematic revision. Workshop results will be published as a single volume of Smithsonian Contributions to Science. Contact Dr. Michael Vecchione, FTS 357-4990 or (202) 357-4990.

LIST OF 1987 CENTER PUBLICATIONS & REPORTS PREPARED

The Center has prepared "An Indexed Bibliography of Northeast Fisheries Center Publications and Reports for 1987." The bibliography contains 70 peer-reviewed publications, 23 non-peer-reviewed reports, and subject and author indices. To make the subject index more useful to fisheries researchers and managers, it is composed of three subindices--organisms, geographic areas, and topics. Copies will be available by October 1. Contact Jon A. Gibson, FTS 840-1228 or (508) 548-5123.

RECENT PUBLICATIONS & REPORTS

Reprints of publications and copies of reports are available in limited numbers on a first-come, first-served basis by writing to: Information Services Section, Northeast Fisheries Center, Woods Hole, MA 02543.

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BENWAY, R. L. 1988. Water column thermal structure across the shelf and slope southeast of Sandy Hook, New Jersey, in 1987. NAFO [Northw. Atl. Fish. Org.] SCR [Sci. Counc. Res.] Doc. 88/06. 7 pp.

BENWAY, R. L., and J. W. JOSSI. 1988. Expendable bathythermograph observations from the NMFS/MARAD Ship of Opportunity Program. [Nat. Mar. Fish. Serv., Northe. Fish. Ctr.,] Mar. Climatol. Invest. Data Anal. Prod. No. 25. 19 pp.

Botton, M. L., and J. W. ROPES. 1987. The horseshoe crab, Limulus polyphemus, fishery and resource in the United States. Mar. Fish. Rev. 49(3):57-61.

CALABRESE, A., L. J. BUCKLEY, and J. C. POWELL. 1988. Contaminants in Hudson-Raritan Estuary water and influence of cold storage upon its chemical composition. NOAA [Nat. Ocean. Atmos. Admin.] Tech. Mem. NMFS [Nat. Mar. Fish. Serv.] F/NEC-53. 37 pp.

FARLEY, C. A. 1988. A computerized coding system for organs, tissues, lesions, and parasites of bivalve mollusks and its application in pollution monitoring with Mytilus edulis. Mar. Environ. Res. 24:243-249.

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MacKENZIE, C. L. 1987. Public oyster bed enhancement. Pages 192-193 in J. F. Roach ed. Atlantic Canada Aquaculture Workshop--proceedings. [Can. Dep. Fish. Oceans] Gen. Educ. Ser. 5(1).

NATIONAL SYSTEMATICS LABORATORY, NORTHEAST FISHERIES CENTER. 1988. National Systematics Laboratory report for calendar year 1987. Available from National Marine Fisheries Service, National Systematics Laboratory, National Museum of Natural History, 10th & Constitution Ave., N. W., Washington, DC 20560. 15 pp.

O'BRIEN, L., and R. K. MAYO. 1988. Sources of variation in catch per unit effort of yellowtail flounder, Limanda ferruginea (Storer), harvested off the coast of New England. Fish. Bull., U.S. 86(1):91-108.

PEREZ FARFANTE, I. 1988. Illustrated key to penaeoid shrimps of commerce in the Americas. NOAA [Nat. Ocean. Atmos. Admin.] Tech. Rep. NMFS [Nat. Mar. Fish. Serv.] 64. 32 pp.

RICHARDS, R. A., and D. G. Deuel. 1987. Atlantic striped bass, Morone saxatilis: stock status and the recreational fishery. Mar. Fish. Rev. 49(2):58-66.

ROBOHM, R. A. 1988. Pasteurellosis of striped bass. Pages 362-366 in C. J. Sindermann and D. V. Lightner, eds. Disease diagnosis and control in North American marine aquaculture, second ed. Elsevier/North-Holland, New York.

Rowe, G. T., R. THEROUX, W. PHOEL, H. Quinby, R. Wilke, D. Koschoreck, T. E. Whitledge, P. G. Falkowski, and C. Fray. 1988. Benthic carbon budgets for the continental shelf south of New England. Continent. Shelf Res. 8(5-7):511-527.

SHERMAN, K., M. GROSSLEIN, D. MOUNTAIN, D. BUSCH, J. O'REILLY, and R. THEROUX. 1988. The continental shelf ecosystem off the Northeast coast of the United States. Pages 279-337 in H. Postma and J. J. Zijlstra, eds. Ecosystems of the world: continental shelves (Vol. 27). Elsevier Scientific Publishing Co., Amsterdam, The Netherlands.

SINDERMANN, C. J., and D. V. Lightner, eds. 1988. Disease diagnosis and control in North American marine aquaculture, second ed. Elsevier/North-Holland, New York. 431 pp.

STROUT, G. A. 1988. Variation in the shelf water front position in 1987 from Georges Bank to Cape Hatteras. NAFO [Northw. Atl. Fish. Org.] SCR [Sci. Counc. Res.] Doc. 88/08. 8 pp.

WILLIAMS, A. B. 1988. Notes on decapod and euphausiid crustaceans, continental margin, western Atlantic, Georges Bank to western Florida, USA. Fish. Bull., U. S. 86(1):67-76.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

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AUGUST 1988

IN THIS ISSUE:

GEORGES BANK COD STOCK IN PRECARIOUS STATUS

MACKEREL HARVESTS COULD BE INCREASED

COLLAPSED NANTUCKET SHOALS/GEORGES BANK HERRING POPULATION SHOWS SIGNS OF RECOVERY

"FISHERMEN'S REPORT" AVAILABLE ON SEA SCALLOP SURVEY

FINFISH BIOMASS ESTIMATED BY ICHIHYOPLANKTON SURVEYS

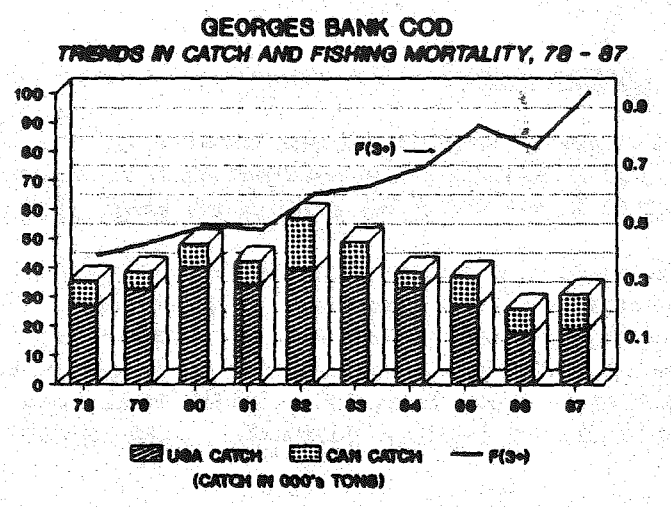
MODEL DEVELOPED TO IMPROVE FISHERY MANAGEMENT BASED ON CONCEPT OF MAXIMUM SUSTAINABLE YIELD

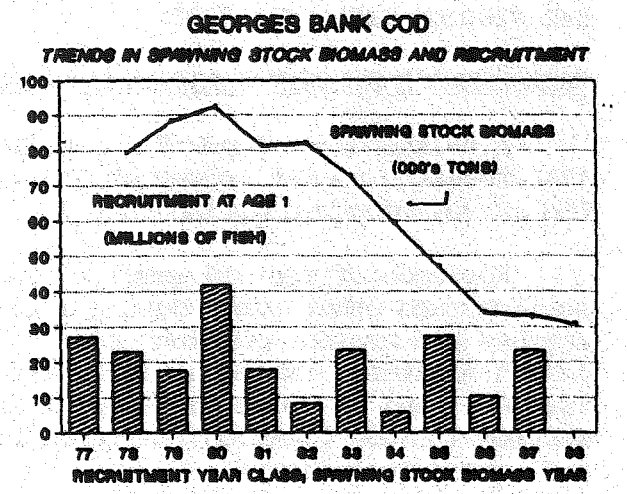
The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

GEORGES BANK COD STOCK IN PRECARIOUS STATUS

Recent computation of the fishing mortality of Georges Bank cod during 1987 showed the mortality rate to be the highest ever recorded for this fish stock. At the 1987 fishing mortality rate, only about 30 percent of the Georges Bank cod that were alive at the beginning of 1987 survived to the beginning of 1988. When such high fishing mortality has been maintained on a continuing basis in other cod stocks worldwide, stock collapses have occurred. Stock status is precarious.

Ironically, the 1988 U.S. commercial catch of Georges Bank cod has been projected by Center scientists to increase by about a fourth over 1987 to around 53 million pounds. The increased 1988 catch will result from continued record-high fishing effort for cod and from the above-average number of cod hatched back in 1985 (the 1985 year class) that are now fully vulnerable to commercial fishing operations (recruited to the fishery). At the current fishing mortality rate, though, the 1985 year class will be quickly depleted, and the 1989 fishery will have to depend upon what will be the fully recruited 1986 year class and the partially recruited 1987 year class. The 1986 year class is way below average in size; the 1987 year class, however, currently appears strong. Prospects for the 1989 fishery are not good. Contact Dr. Fredric M. Serchuk, FTS 840-1245 or (508) 548-5123.





MACKEREL HARVESTS COULD BE INCREASED

Harvests of Northwest Atlantic mackerel could be increased to 330-440 million pounds annually without appreciably lowering the size of the spawning population. Recent harvests have been about 150 million pounds annually. Catches could be increased because the population is very large (i.e., biomass now exceeds 2.2 billion pounds) and natural, density-dependent factors--not fishing--are the limiting factors in the population.

Evidence of these density-dependent factors comes from recent Center studies which show that since 1980: (1) average fish growth is slower, (2) average fish size is smaller, and (3) predation mortality rates are higher in the larger year classes. Because of these natural, compensatory mechanisms operating within the population, keeping harvests at their current rates (with recruitment remaining at recent levels)

will no longer ensure annual increases in the biomass of Northwest Atlantic mackerel. Contact Dr. William J. Overholtz, FTS 840-1256 or (508) 548-5123.

COLLAPSED NANTUCKET SHOALS/GEORGES BANK HERRING POPULATION SHOWS SIGNS OF RECOVERY

Center ichthyoplankton surveys show growing evidence of a recovery of the Atlantic herring population in the Nantucket Shoals/Georges Bank area. This area was the principal spawning grounds for herring off the northeastern United States in the 1960's and early 1970's. The area's herring population collapsed, though, in 1977 after more than a decade of heavy fishing. Testimony to the collapse was the area's fishery plummeting from 320 million pounds of landings in 1975 to zero pounds in 1978.

There was little or no evidence of spawning in the area for the next seven years. That changed in 1985 when Center scientists found the highest abundance of herring larvae in the Nantucket Shoals/Georges Bank area since the surveys began in 1977. Larval concentrations during the 1985-87 fall spawning seasons have been greater around Nantucket Shoals than on Georges Bank, but increased catches of larvae on the bank in recent years indicate that a recovery is underway there as well.

Ichthyoplankton surveys are planned for the fall 1989 spawning season to estimate the size of the area's adult herring spawning biomass. Contact Wallace G. Smith, FTS 342-8260 or (201) 872-0200.

"FISHERMEN'S REPORT" AVAILABLE ON SEA SCALLOP SURVEY

A "Fishermen's Report" is available free of charge on the results of the Center's 1988 research vessel survey of sea scallop resources from Georges Bank to Cape Hatteras The survey occurred during July 7 - August 10 on the NOAA research vessel Albatross IV

For each of the 619 sampling stations of the survey, the report lists the catch of scallops and other items during a 15-minute tow of a commercial-type dredge. Scallop catches are broken down into three categories of shell height: (1) less than 90 mm (which equates to more than 40 meats per pound); (2) more than 90 mm (equates to less than 40); and (3) more than 100 mm (equates to less than 30). Additional data on each station include location (latitude/longitude and Loran C bearings), tow course, depth, and bottom temperature.

To receive a copy, or to subscribe to future copies of this issue (sea scallop survey) or other issues (spring & fall bottom trawl surveys and surf clam/ocean quahog survey) of the Fishermen's Report series, write to: Resource Surveys Investigation, Northeast Fisheries Center, Woods Hole, MA 02543. Contact Linda I. Despres-Patanjo, FTS 840-1346 or (508) 548-5123.

FINFISH BIOMASS ESTIMATED BY ICHTHYOPLANKTON SURVEYS

The Center has prepared a 132-page report that analyzes and evaluates the 25,000 samples of fish eggs and larvae collected on the bimonthly MARMAP ichthyoplankton surveys of the Northeast Shelf Ecosystem during 1977-87. Based upon these ichthyoplankton survey data, Center scientists estimate the ecosystem's total finfish biomass to have ranged between 5.3 and 8.6 million metric tons for the 1979-84 period.

These biomass estimates derived from the Center's ichthyoplankton surveys are similar to the biomass estimates derived from the Center's bottom trawl surveys for the 1960's, but are significantly higher than the trawl-survey-derived estimates for the 1980's. We attribute the higher estimates from ichthyoplankton survey data for the 1980-84 period to: (1) the ability of the ichthyoplankton surveys' sampling technique and gear (i.e., top-to-bottom coverage) to sample better those species which have little or no vulnerability to the bottom trawl surveys' technique and gear (i.e., bottom coverage only); and (2) a shift in relative biomass in recent years from the larger, more economically desirable, demersal finfish (e.g., haddock) to the smaller, less desirable, pelagic finfish (e.g., sand lance). While total finfish biomass of the Northeast Shelf Ecosystem may have remained stable, individual finfish biomass has changed greatly.

Our evaluation of the ichthyoplankton surveys' effectiveness and efficiency show that: (1) such surveys are not supplementary, but complementary, to the bottom trawl surveys; (2) the frequency of such surveys and the number of samples per survey are the most important factors in obtaining good data; and (3) the actual frequency and sampling of our ichthyoplankton surveys in recent years has been minimally adequate. Contact Dr. Kenneth Sherman, FTS 838-6211 or (401) 782-3211.

MODEL DEVELOPED TO IMPROVE FISHERY MANAGEMENT BASED ON CONCEPT OF MAXIMUM SUSTAINABLE YIELD

The Center has developed a model to help fisheries managers with one of the difficult aspects of managing fisheries under the Magnuson Fishery Conservation and Management Act. The Magnuson Act calls for management of fish stocks on the basis of maximum sustainable yield (MSY). The premise of MSY is that there is a constant catch level for each fish stock which maximizes that catch but leaves enough spawners to fully replenish the stock. However, MSY depends upon a constant biological and environmental setting for the target fish stock--something that doesn't exist in nature.

As a first step in dealing with the MSY problem, the Center has developed a model which predicts the actual effects on fishing effort and catch as a result of setting any one of several target constant catch levels. Benefits of the model will include a better assessment of the risks of various fisheries management decisions, and could lead to improvements of economic efficiency in the fishing industry's harvesting and processing sectors. Contact Dr. Steven A. Murawski or Joseph Idoine, FTS 840-1303/1217 or (508) 548-5123.

J. Gibson

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts 02543

SEPTEMBER 1988

IN THIS ISSUE:

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UNUSUAL MARINE ENVIRONMENTAL CONDITIONS OF THE EARLY 1980s REPORTED

NEW CAPABILITY DEVELOPED TO PORTRAY SEA SURFACE TEMPERATURE CHANGES

12-MILE DUMPSITE LOBSTER TAGGING PROGRAM AMENDED

ULCER DISEASE OUTBREAKS IN COASTAL/ESTUARINE FISH REVIEWED

BLUE SHARK FOOD HABITS DOCUMENTED

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

MODEL USED TO EVALUATE CLOSED AREAS AS FISHERIES MANAGEMENT TECHNIQUE

The Center recently presented a paper on its research concerned with the use of models to evaluate closed areas as a fisheries management technique. The paper was presented at the Interdisciplinary Conference on Natural Resource Modeling and Analysis, held in Halifax, Nova Scotia, during September 29 - October 1. The model used by the Center projects both the yield per recruit as well as the stock biomass per recruit when only a portion of any given year class is vulnerable to fishing gear, the latter being the intended situation when a portion of a fishing ground is closed.

The model shows that in some cases closed areas may be useful in regulating fishing mortality within a fish stock. However, because there is a lack of quantitative data on the movements of many fish stocks into and out of any given area, it will, in many cases, be difficult to assess quantitatively the effects of closed areas on fishing mortality. Also, the effective use of a closed area will most likely require a management approach which is both experimental and adaptable. Contact Dr. Tom Polacheck, FTS 840-1397 or (508) 548-5123.

UNUSUAL MARINE ENVIRONMENTAL CONDITIONS OF THE EARLY 1980s REPORTED

A recent special meeting of the Northwest Atlantic Fisheries Organization addressed the effects of the unusual environmental conditions in the Northwest Atlantic during the early 1980s on the distribution, abundance, and availability of marine species. The Center presented three papers at the meeting which dealt with: (1) "Sea Surface Wind Stress Anomalies in 1981-1987 off the Northeastern U.S.A.," (2) "Air Temperature and Wind Speed Anomalies in 1981-1987 at Coastal Weather Stations in the Northeastern U.S.A.," and (3) "Sea Surface Temperature Anomalies off the Northeastern U.S.A. during 1981-1986." Copies are available. Contact Joyce Denecour, FTS 838-6311 or (401) 782-3311.

NEW CAPABILITY DEVELOPED TO PORTRAY SEA SURFACE TEMPERATURE CHANGES

In cooperation with the University of Rhode Island, we have developed the capability to produce contoured charts showing changes in sea surface temperature between any two scenes of infrared data obtained by NOAA polar-orbiting satellites. This capability can be used to produce charts showing the differences in sea surface temperatures for any time period for which there are data available. Such charts can be used to answer the frequently asked question, "How do current sea surface temperatures differ from those in previous years?" For more information on research applications, contact Carol Fairfield, FTS 838-6284 or (401) 782-3284.

12-MILE DUMPSITE LOBSTER TAGGING PROGRAM AMENDED

As indicated in the March 1988 issue of Monthly Highlights, Center scientists have begun a two-to-three-year tagging program with lobsters from the 12-Mile Dumpsite in the New York Bight apex. Lobsters are being tagged with 1.5-inch-long, pink or yellow-colored "spaghetti" tags which offer a reward. The March issue indicated that possession of tagged, but legally undersized ("short") lobsters would be permitted provided that the tag remained in the lobster and that the lobster was promptly returned to a NMFS port agent.

The tagging program has been amended, however, such that the reward is three dollars plus the landed value of only tagged, legally sized lobsters, and can be claimed by returning the legally sized lobster to a NMFS port agent or to the Center's Sandy Hook Laboratory in Highlands, New Jersey. Tagged, short lobsters should not be retained; the tags should be removed and the animals measured and released immediately. The tag, along with a note on each lobster's length and location where captured, should be sent to the Sandy Hook Laboratory. Contact Judy Rugg, FTS 342-8216 or (201) 872-0200.

ULCER DISEASE OUTBREAKS IN COASTAL/ESTUARINE FISH REVIEWED

The Center has released a report on outbreaks ("epizootics") of ulcer and ulcer-related disease ("ulcerative syndromes") in coastal/estuarine fish. Issued as NOAA Technical Memorandum NMFS-F/NEC-54, the report reviews some of the more extensive outbreaks worldwide, particularly from the viewpoint of their causes and population effects. Following the review, the report: (1) proposes how such epizootics begin, including the roles of environmental stress (e.g., toxic chemicals) and infectious agents (e.g., viruses); (2) categorizes the kinds of population effects due to such epizootics; and (3) provides recommendations for the direction of future research. A limited number of copies are still available. Contact Dr. Carl J. Sindermann, (301) 226-5193.

BLUE SHARK FOOD HABITS DOCUMENTED

We have prepared a report on the food and feeding habits of blue sharks. Since blue sharks are the most abundant species of large pelagic sharks in the Atlantic, they have a major effect at the top of the marine food web.

Our studies show that, in general, the daily ration of food for blue sharks is lower than that for bony fishes such as tunas. Blue sharks consume 0.6 percent of their body weight daily, which means an average sized blue shark of 85 pounds consumes approximately 186 pounds of prey each year. Major food items are squids, hakes, lancetfishes, Atlantic herring, Atlantic mackerel, bluefish, butterfish, marine mammals, skates, and other sharks. Contact Dr. Nancy E. Kohler, FTS 838-6332 or (401) 782-3332.

J. Gibson

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MONTHLY HIGHLIGHTS

United States Department of Commerce
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OCTOBER 1988

IN THIS ISSUE:

OUTLOOK FOR SHRIMP FISHERY IS BETTER IN 1990 THAN 1989

ENCOURAGING NUMBER OF TAGGED U.S. SALMON RECOVERED IN CANADA

SEDIMENTS AT PHASED-OUT 12-MILE DUMPSITE APPARENTLY RECOVERING

LOW DISSOLVED OXYGEN LEVELS SLOW FLOUNDER GROWTH

CEPHALOPODS OBSERVED DIRECTLY WITH RESEARCH SUBMERSIBLE

SOME ANTARCTIC FISH STOCKS DEPLETED; CONSERVATION UNDERTAKEN

RECENT PUBLICATIONS AND REPORTS

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OUTLOOK FOR SHRIMP FISHERY IS BETTER IN 1990 THAN 1989

Expect no significant increase in landings in the upcoming northern shrimp fishery in the Gulf of Maine. That's the recent assessment of the Northern Shrimp Technical Committee of the Atlantic States Marine Fisheries Commission. Center scientists serve on the Committee.

Abundance and biomass of mature female shrimp (which are of primary importance in the Gulf of Maine fishery) have declined continually since 1985. An apparently large 1987 year class is in the population, but shrimp from this year class will be too small to contribute significantly to the 1989 fishery. The 1987 year class should recruit strongly, however, to the 1990 fishery. Contact Dr. Stephen H. Clark, FTS 840-1312 or (508) 548-5123.

ENCOURAGING NUMBER OF TAGGED U.S. SALMON RECOVERED IN CANADA

U.S. and Canadian federal fisheries personnel cooperatively sampled nearly 10,000 Atlantic salmon captured by Canadian commercial fishermen during July and August along the Newfoundland and Labrador coasts. Preliminary analysis shows that 23 of the salmon had internal coded-wire tags, and that 20 of those 23 fish were of U.S. origin. The other three were of Canadian origin.

Most of the U.S.-origin tags were from fish that had been released as smolts (juveniles) in Maine and Connecticut rivers, and were destined to return to their home rivers this coming spring. In light of the disappointingly small returns of salmon to the Connecticut River in recent years, the recovery of so many tagged fish in the Canadian summer fishery is an encouraging sign. Contact Dr. Kevin D. Friedland, FTS 840-1369 or (508) 548-5123.

SEDIMENTS AT PHASED-OUT 12-MILE DUMPSITE APPARENTLY RECOVERING

Preliminary analysis of our studies of the 12-Mile Dumpsite in the New York Bight shows that sediment quality is apparently improving in response to the phase-out of sewage sludge dumping there. Toxic metal concentrations, sediment reduction-oxidation potential, and seabed oxygen consumption have all quickly improved.

Dumping at the site was phased out in a stepwise fashion between March 1986 and December 1987. Our formal study of the site began in July 1986, although some data on the site's fisheries resources and habitats were available from other studies going back to the late 1960's.

Data on the distribution and abundance of bottom-living invertebrates, used as indicators of pollution effects, are available only through summer 1987. At that time, there were no clear responses to the reduction in sludge dumping. Possible exceptions were the total number of species and the number of crustacean species, both of which had significant dips in summer

1986, but not in summer 1987. Contact Robert Reid, FTS 342-8200 or (201) 872-0200.

LOW DISSOLVED OXYGEN LEVELS SLOW FLOUNDER GROWTH

With low dissolved oxygen levels (hypoxia) continuing to be a problem in many Northeast inshore areas, the Center has continued studies of hypoxic effects on fisheries resources. Recent experiments examined the effects of long-term exposure to hypoxia (about 2 mg/l of dissolved oxygen) on the growth of young-of-the-year winter flounder. After 11 weeks, the hypoxic-exposed flounder were 28 percent smaller than flounder exposed to normal dissolved oxygen levels (about 7 mg/l). Such reduced/slowed growth would, at least, increase the time spent at smaller and more predatorily vulnerable sizes, and could increase predatory mortality.

As part of this study, we are currently looking at the potential for growth compensation in these smaller fish as oxygen levels return to "normal." Contact Allen Bejda or Beth Valdes, FTS 342-8200 or (201) 872-0200.

CEPHALOPODS OBSERVED DIRECTLY WITH RESEARCH SUBMERSIBLE

The National Systematics Laboratory has used a research submersible to directly study midwater cephalopods (e.g., squids) in the Bahamas. Using the submersible Johnson Sea-Link for 18 dives in 10 days, the Laboratory gathered data on 15 cephalopod species, collected 22 specimens in exceptionally good condition (many were photographed alive on board the mother ship, Seward Johnson), and recorded 25 videotape sequences.

Some species that are rare in trawl collections were seen to be common. Several behavior patterns that have not been reported before were observed. Also, the collection of cephalopods that are semi-gelatinous and easily damaged by trawls should be valuable for taxonomic studies. Contact Dr. Michael Vecchione, FTS/(202) 357-4990.

SOME ANTARCTIC FISH STOCKS DEPLETED; CONSERVATION UNDERTAKEN

Center scientists participated in the seventh annual meeting of the Commission for the Conservation of Antarctic Marine Living Resources held in Hobart, Tasmania, during October 12 - November 4. The Fish Stock Assessment Working Group reported on the condition of Antarctic fish stocks for the 1988-89 fishing season. Several species in the South Georgia region, notably *Notothenia rossii*, are in a precarious condition; other stocks have been seriously depleted.

Conservation measures, however, have been initiated and total allowable catch levels have been recommended for two consecutive years. Careful management of these stocks will be needed because

of the multispecies nature of the fishery. Contact Dr. William J. Overholtz, FTS 840-1256 or (508) 548-5123.

RECENT PUBLICATIONS AND REPORTS

Reprints of publications and copies of reports listed below are available in limited numbers on a first-come, first-served basis by writing to the senior Center author (whose name appears in all capital letters) care of: Information Services Section, Northeast Fisheries Center, Woods Hole, MA 02543 USA.

BOLZ, G.R., and R.G. LOUGH. 1988. Growth through the first six months of Atlantic cod, Gadus morhua, and haddock, Melanogrammus aeglefinus, based on daily otolith increments. Fish. Bull., U.S. 86(2): 223-235.

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WILLIAMS, A.B. 1988. Lobsters of the world -- an illustrated guide: lobsters of the world in U.S. trade. Osprey Books, Huntington, N.Y. 186 pp.

WILLIAMS, A.B. 1988. New marine decapod crustaceans from waters influenced by hydrothermal discharge, brine, and hydrocarbon seepage. Fish. Bull., U.S. 86(2): 263-287.

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MONTHLY HIGHLIGHTS

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NOVEMBER 1988

IN THIS ISSUE:

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SCALLOP GEAR RESEARCH PAPER PRESENTED AT FISHING GEAR & VESSEL DESIGN SYMPOSIUM

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

STATUS-OF-THE-STOCKS REPORT ISSUED

The Center has issued the "Status of the Fishery Resources Off the Northeastern United States for 1988" as NOAA Technical Memorandum NMFS-F/NEC-63. The 135-page report reviews the status of 33 species or species groupings. Also covered are trends in commercial and recreational fisheries, economic aspects of commercial fisheries, and overall resource abundance.

All 1,000 copies from the first printing have been distributed. Single copies from the second printing of 400 will be available on a first-come, first-served basis. Contact Dr. Tim D. Smith, FTS 840-1251 or (508) 548-5123.

SEVENTH STOCK ASSESSMENT WORKSHOP CONDUCTED; REPORT SOON AVAILABLE

The Seventh Stock Assessment Workshop, hosted by the Center during November 28 - December 1, reviewed the current assessments of Gulf of Maine and Georges Bank cod, Southern New England and Georges Bank yellowtail flounder, and Southern New England scup. The workshop also addressed the problem of by-catch (i.e., the catching of non-target species) in the Northeast's multispecies fisheries. A report detailing workshop results is being prepared. To request a copy, contact Gary Shepherd, FTS 840-1368 or (508) 548-5123.

COASTAL STRIPER INDEX LAGS LAST YEAR'S LEVEL

Somewhat fewer striped bass showed up in this autumn's haul-seine survey along Long Island compared with last autumn. The haul-seine survey is one of four projects sponsored by the National Marine Fisheries Service under the federal Emergency Striped Bass Study. The study's Planning & Coordination Group met on December 1 in Washington, D.C., to review these projects.

In addition to the haul-seine survey results, the group noted that: (1) reproductive biology research has shown striper maturation rates to be considerably slower than previously thought; (2) the coastwide tagging program, which will continue through 1989, has so far tagged 50,000 stripers and received a suprisingly high 10 percent return rate; and (3) sampling will begin next spring to determine the best available method for identifying the spawning stock from which any given striper originates. Contact Dr. R. Anne Richards, FTS 840-1357 or (508) 548-5123.

SEA SAMPLING CONTRACT AWARDED TO MANOMET BIRD OBSERVATORY

The Center has awarded a contract to the Manomet Bird Observatory of Manomet, Mass., to conduct an experimental program of sea sampling. Under the contract, Manomet Bird Observatory will place biological technicians (sea samplers) aboard U.S. commercial

fishing vessels in the Northeast to sample vessel catches and collect detailed information on vessel operations. The contract calls for sea sampling of about 200 commercial fishing trips between January 1 and September 30, 1989, covering six major Northeast fisheries.

Fisheries to be sampled are the small-mesh and shrimp fisheries in the Gulf of Maine, the large-mesh and experimental silver hake (whiting) fisheries on Georges Bank, the Nantucket Shoals trawl fishery, and the winter trawl fishery offshore of the Mid-Atlantic Bight and Chesapeake Bay. Contact Gregory R. Power, FTS 840-1266 or (508) 548-5123.

FISHERMEN'S REPORT AVAILABLE FOR AUTUMN BOTTOM TRAWL SURVEY

A Fishermen's Report, based on the Center's 1988 autumn bottom trawl survey, is available free of charge. The report lists the composition and size of catches of 24 commercially and recreationally important species at 326 sites between the western Scotian Shelf and Cape Hatteras. The report also includes information on the exact location (latitude & longitude and Loran C bearings), tow direction, time of day, water depth, and bottom temperature of the sampling sites. This autumn's survey was conducted aboard the Albatross IV during September 12 - October 28.

The survey's largest catches of Atlantic cod--the dominant groundfish in the Northeast's fisheries--were from the Northeast Peak of Georges Bank (Canadian waters), the Southeast Channel, and Massachusetts Bay. The largest catches of haddock were from the Northeast Peak. We again found young-of-the-year haddock as far south as the New York - New Jersey coast, but in smaller numbers than last year.

The Fishermen's Report series is composed of four reports: the spring and autumn bottom trawl surveys, the surf clam - ocean quahog survey, and the sea scallop survey. Anyone wishing to subscribe to one or all of these reports should write to Linda I. Despres-Patanjo, National Marine Fisheries Service, Woods, MA 02543, or call FTS 840-1346 or (508) 548-5123.

TRAWL SURVEY WORKSHOP CONDUCTED; REPORT SOON AVAILABLE

A trawl survey workshop, sponsored by the National Marine Fisheries Service and the Atlantic States Marine Fisheries Commission, was held during November 1-3 in Woods Hole. Objectives were to inform state and federal researchers of ongoing and planned survey programs, increase cooperation, and promote data exchange. Among the topics discussed were; (1) random (i.e., variable) versus fixed-location sampling sites; (2) selection and standardization of sampling gear; (3) new applications for trawl

survey data; (4) computer entry of data at sea; and (5) hydroacoustic and gear-performance monitoring equipment.

A report of the workshop will become available in early 1989. To request a copy of the report, contact Thomas R. Azarovitz, FTS 840-1283 or (508) 548-5123.

FISHERIES TECHNOLOGY PAPER PRESENTED & MID-ATLANTIC POLLUTION DISCUSSED AT MARINE TECHNOLOGY CONFERENCE

Center scientists recently presented a paper on "Marine Fisheries Technology in the United States: Status, Trends, and Future Directions." The paper, presented at the Oceans '88 Conference during October 31 - November 2 in Baltimore, Md., covers the past 20 years of U.S. fisheries. Copies of the presentation are available.

The conference also held a special session on environmental degradation in the Mid-Atlantic Bight. Papers were presented on medical waste dumping, unusual plankton blooms, marine mammal deaths, and the relationship of these activities/events to the overall pollution of the bight. Contact Dr. Fredric M. Serchuk, FTS 840-1245 or (508) 548-5123, for more information on fisheries technology, and Dr. John B. Pearce, FTS 840-1263 or (508) 548-5123, for more information on environmental degradation.

SCALLOP GEAR RESEARCH PAPER PRESENTED AT FISHING GEAR & VESSEL DESIGN SYMPOSIUM

"Recent USA Sea Scallop Gear Research" is a paper presented by Center scientists at the First World Symposium on Fishing Gear and Vessel Design, held during November 21-24 in St. Johns, Nfld. The paper reviews gear design changes in the Northwest Atlantic sea scallop fishery since it began in the early 1870's, as well as recent research efforts aimed at reducing juvenile mortality, improving gear selectivity, reducing non-catch mortality, and enhancing resource survey capabilities. Gear developments are evaluated in a management context, and probable trends in future gear design are identified for both sea scallop and other fisheries worldwide. Contact Dr. Fredric M. Serchuk, FTS 840-1245 or (508) 548-5123.

J. Gibson

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts 02543

DECEMBER 1988

IN THIS ISSUE:

SEA SCALLOPS REMAIN ABUNDANT

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INVERTEBRATE POPULATIONS DEVELOP POLLUTION TOLERANCE

97 PERCENT OF LANDINGS IN EXPERIMENTAL SILVER HAKE FISHERY ARE TARGET SPECIES

SURVEYS OF ANTARCTIC WILDLIFE PUBLISHED

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

SEA SCALLOPS REMAIN ABUNDANT

Sea scallops off the northeastern United States will continue to be abundant in 1989. That's the conclusion of a recent Center evaluation of this resource entitled "Status of the Sea Scallop Resources off the Northeastern United States, 1988." The Center's 1988 sea scallop survey of Mid-Atlantic waters yielded the highest index of scallop abundance obtained in that region during the period of 1975-88. Excellent recruitment by the 1985 year class of scallops boosted the index to its high level. The survey of the U.S. portion of Georges Bank yielded a slightly lower index than the relatively high one obtained for that region during the 1987 survey. Recruitment by the 1985 year class appears to be only average in the Georges Bank region.

Although U.S. fishing effort for sea scallops in 1988 reached a record level, the present high abundance should allow U.S. catches in 1989, and possibly 1990, to remain near the recent high levels of about 28.7 million pounds of meats. To obtain a copy of the Center's sea scallop assessment report, contact Dr. Fredric M. Serchuk, FTS 840-1245 or (508) 548-5123.

INFORMATION PUBLISHED ON MID-ATLANTIC'S ENVIRONMENT AND RESOURCES

The Center has published a "Characterization of the Middle Atlantic Water Management Unit of the Northeast Regional Action Plan" as NOAA Technical Memorandum NMFS-F/NEC-56. The 322-page publication is a collection of 11 reports, each of which brings together and discusses the available data on the environment and different categories of living resources of Middle Atlantic Shelf waters. Copies are available.

The Northeast Regional Action Plan encourages the synthesis of the numerous, and occasionally disparate or cryptic, environmental and living resource data for the Plan's six water management units (WMUs). (In addition to the Middle Atlantic Shelf, the other WMUs are the Gulf of Maine, coastal Gulf of Maine, Georges Bank, coastal Middle Atlantic, and off shelf.) The Middle Atlantic WMU characterization is the first such synthesis document. It is intended to provide a convenient source of information for resource managers and decision-makers concerned with the effects of human activities on the area's living resources and their habitats.

Comments and suggestions on the usefulness of this first characterization will be welcomed. Contact Anthony L. Pacheco, FTS 342-8290 or (201) 872-0200, or Dr. Bruce E. Higgins, FTS 840-1340 or (508) 548-5123.

INVERTEBRATE POPULATIONS DEVELOP POLLUTION TOLERANCE

Our field experiments in the Hudson-Raritan Estuary show that populations of colonizing invertebrates (polychaete worms, nematode worms, harpacticoid copepods) that are continually exposed to heavy-metal pollution can evolve some tolerance to this

form of pollution. Since many invertebrates are important forage for fisheries resource species, the ability to tolerate increased metal contamination may decrease the pollution-related loss of forage for resource species. It may, however, also increase the accumulation of heavy metals in resource species, possibly affecting their health. Contact Clyde L. MacKenzie, FTS 342-8267 or (201) 872-0200.

97 PERCENT OF LANDINGS IN EXPERIMENTAL SILVER HAKE FISHERY ARE TARGET SPECIES

Silver hake were 80 percent of the catch and 97 percent of the landings in an experimental fishery conducted cooperatively by the Center and the commercial fishing industry. The experimental fishery was conducted to determine the feasibility of having a small-mesh trawl fishery specifically for silver hake in an area otherwise limited to large-mesh trawls by the Northeast Multi-species Fishery Management Plan to conserve small/young groundfish (Atlantic cod, yellowtail flounder, etc.).

The experimental fishery occurred during July-October on the northwestern edge of Georges Bank. Seventeen vessels made 119 trips, catching 5.0 million pounds and landing 4.9 million pounds of silver hake. The fishery caught 68 thousand pounds and landed 37 thousand pounds of Plan-regulated groundfish species (mostly white hake and Atlantic cod). About 1.2 million pounds of other species were caught, but only 136 thousand pounds were landed. The primary species discarded were red hake, skates, northern shortfin squid, Atlantic herring, and spiny dogfish. Contact Frank P. Almeida, FTS 840-1308 or (508) 548-5123.

SURVEYS OF ANTARCTIC WILDLIFE PUBLISHED

As part of the U.S. Antarctic Marine Living Resources Program, two reports on Antarctic wildlife have been published in the Center's subseries of the NOAA Technical Memorandum NMFS series. Issue 59 covers "Surveys of Breeding Penguins and Other Seabirds in the South Shetland Islands, Antarctica, January-February 1987." Issue 60 covers the "Survey of Antarctic Fur Seals in the South Shetland Islands, Antarctica, during the 1986-1987 Austral Summer." A limited number of copies are available. Contact Dr. Kenneth Sherman, FTS 838-6210 or (401) 782-3210.

J. Gibson

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
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JANUARY 1989

IN THIS ISSUE:

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HARD DATA FOR BLUE SHARK AGE DETERMINATION

RECENT PUBLICATIONS AND REPORTS

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

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SHELLFISH HARMED BY FEEDING ON METAL-CONTAMINATED PHYTOPLANKTON

Reduced growth, loss of weight, and even mortality can occur in shellfish when they feed on phytoplankton contaminated with toxic metals. This finding stems from laboratory experiments in which young post-set eastern oysters and northern quahogs were fed diets of three common microalgae species (*Isochrysis galbana*, *Dunaliella tertiolecta*, and *Phaeodactylum tricornutum*) that had been induced to tolerate, and had been cultured in, a growth medium with high levels of cadmium.

As these cadmium-tolerant strains of single-celled microalgae accumulated the metal in their cells, they also developed abnormal proportions of protein, fat, and carbohydrate. Thus, toxicity and nutrition may interact when shellfish feed on metal-contaminated phytoplankton.

The implications of this finding are being considered for those shellfish populations exposed to toxic metals in polluted riverine outflow, inshore industrial and sewage discharges, and offshore industrial and sewage sludge dumping. Contact Gary H. Wikfors, FTS 642-5225 or (203) 783-4225.

COOLING OF SURFACE WATERS IN SUMMER 1988

Surface waters along the Mid-Atlantic coast, particularly New Jersey and Delaware, cooled significantly in summer 1988. A NOAA data buoy moored off northern Delaware recorded five periods of surface cooling altogether occupying 75 percent of the summer. Recreational fishermen reported that at times during the summer they had to go 20-25 miles offshore to find surface temperatures and pelagic fishes that they would normally find near shore.

The most prominent period of surface cooling was in August. The NOAA data buoy off northern Delaware recorded a drop of 11°F; a NOAA shore station along the Atlantic City, New Jersey, beach recorded a drop of 23°F; and a NOAA satellite showed the surface cooling extending over almost the full width of the continental shelf from northern Virginia to eastern Long Island, New York. At the same time, record and near-record high air temperatures were being reported on land throughout much of the Northeast.

Each cooling event in surface waters was associated with strong, persistent southwesterly winds, or steady high winds. The southwesterly winds led to upwelling along the coast of cool subsurface waters; the high winds to mixing of surface waters with cool subsurface waters. Contact Margaret Sano, FTS 838-6284 or (401) 782-3284.

HARD DATA FOR BLUE SHARK AGE DETERMINATION

To be sure that the rings seen in blue shark vertebrae are actually annular growth rings, we injected 544 tagged blue sharks with the common antibiotic tetracycline which stains the vertebrae. All tissues, including the rings, added to the vertebrae after injection didn't show the stain. Consequently, if the rings are annular, then one unstained ring should be present for each year the shark is at liberty after injection.

We've had two of the injected sharks returned. One was returned so soon (nine months) after its release that it had not had time to deposit an annular ring. The other was returned in December 1988 after more than 18 months at liberty. Under ultraviolet light, the vertebrae of the December-returned shark revealed one clear unstained ring outside the bright yellow stained rings. In the 18 months of liberty, the blue shark had grown from 45.7 inches to 65.4 inches, or about 13.0 inches per year.

These findings support our hypothesis that the vertebral rings of blue sharks are annular, as well as the accuracy of our other methods for age and growth determination in this species. Contact John G. Casey, FTS 838-6320 or (401) 782-3320.

RECENT PUBLICATIONS AND REPORTS

Reprints of publications and copies of reports listed below are available in limited numbers by writing to the senior Center author (whose name appears in capitals) care of: Information Services Section, Northeast Fisheries Center, Woods Hole, MA 02543 USA.

CONSERVATION & UTILIZATION DIVISION, NORTHEAST FISHERIES CENTER. 1988. Status of the fishery resources off the northeastern United States for 1988. NOAA [Nat. Ocean. Atmos. Admin.] Tech. Mem. NMFS [Nat. Mar. Fish. Serv.]-F/NEC-63. 135 pp.

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MURCHELANO, R.A. 1988. Fish as sentinels of environmental health. NOAA [Nat. Ocean. Atmos. Admin.] Tech. Mem. NMFS [Nat. Mar. Fish. Serv.]-F/NEC-61. 16 pp.

OVERHOLTZ, W.J., S.A. MURAWSKI, W.L. MICHAELS, and L.M. DERY. 1988. The effects of density dependent population mechanisms on assessment advice for the Northwest Atlantic mackerel stock. NOAA [Nat. Ocean. Atmos. Admin.] Tech. Mem. NMFS [Nat. Mar. Fish. Serv.]-F/NEC-62. 49 pp.

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NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
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FEBRUARY 1989

IN THIS ISSUE:

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FLATFISH LIVER DISEASE IS INDICATOR OF COASTAL WATER QUALITY

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HISTORICAL ACCOUNT OF RARITAN BAY'S WINTER FISHERY FOR BLUE CRABS

YOUNG STRIPED BASS AFFECTED BY POOR WATER QUALITY

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1988 NEW ENGLAND FISH HARVESTS UP IN WEIGHT, DOWN IN VALUE

Preliminary figures for commercial landings of New England fish and shellfish during 1988 were 568.6 million pounds, valued at 493.2 million dollars. These 1988 figures are up 23.4 million pounds, but down 19.2 million dollars, from the 1987 figures.

This marks the first time since 1984 that the value of New England landings has failed to increase. In the past, decreases in the value of New England landings have generally been attributed to increases in the imports of less expensive Canadian fishery products. However, imports of cod and other finfish from Canada to New England dropped from 1.08 billion pounds in 1987 to 0.95 billion pounds in 1988, indicating that there are probably other market factors affecting prices.

Detailed information on the landings and values on a state, port, and species basis is available. Contact Ronnee L. Schultz, FTS 840-1264 or (508) 548-5123.

FLATFISH LIVER DISEASE IS INDICATOR OF COASTAL WATER QUALITY

The Center has issued a report, "Fish as Sentinels of Environmental Health," on liver disease, including cancer, in Boston Harbor's winter flounder, and on organic contaminants, especially polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs), in the harbor's sediments. The report finds that the relationship between the high prevalences of disease and the high concentrations of contaminants is only circumstantial--no specific cause-and-effect relationship has yet been established.

The fact, however, that flatfishes from areas with high organic contaminant concentrations (e.g., Boston Harbor, Mass., Commencement Bay, Wash.) have high liver disease prevalences, and that flatfishes from areas with low concentrations (e.g., eastern Long Island Sound, western Gulf of Maine) have low prevalences, suggests that flatfish liver disease is a good indicator of environmental quality in the nation's coastal waters.

A limited number of copies of the report, issued as NOAA Technical Memorandum NMFS-F/NEC-61, are available. Contact Dr. Robert A. Murchelano, FTS 840-1263 or (508) 548-5123.

SHELL DISEASE SYNDROME IN MARINE CRUSTACEANS IS DESCRIBED

The Center has published a report on "The Shell Disease Syndrome in Marine Crustaceans." Crustacean shell disease goes under a number of different names, but it's probably the most common and widespread microbially-induced disease in crustaceans.

The report, issued as NOAA Technical Memorandum NMFS-F/NEC-64, discusses the causes and development of the disease syndrome, and then looks at its role in natural habitats, degraded habitats, impounded populations, and aquacultured populations. Also

(cont.)

included is a table summarizing the reported occurrences of shell disease in economically important crustaceans throughout the world.

A limited number of copies of the report are available. Contact Dr. Carl J. Sindermann, (301) 226-5193.

HISTORICAL ACCOUNT OF RARITAN BAY'S WINTER FISHERY FOR BLUE CRABS

An article on "The Winter Dredge Fishery for Blue Crabs in Raritan Bay, New Jersey," has been published. Based on historical accounts, interviews with past and present fishermen, and trips on fishing boats, the article reconstructs the history of this fishery which is at least 100 years old. The first boats were sailing sloops which were used for clamming in the summer and oystering in the autumn. Until the mid-1930s, the three-foot-wide dredges were hand-hauled.

In the 1970s and most of the 1980s, daily crab catches per boat ranged from 4 to 30 bushels. In the 1988-89 season, however, catches ranged mostly from 30 to 50 bushels. The article speculates on the relationship between the extraordinarily warm summers of 1987 and 1988 and the significantly larger catches this past season.

Reprints of the article are available. Contact Clyde M. MacKenzie, FTS 342-8267 or (201) 872-0200.

YOUNG STRIPED BASS AFFECTED BY POOR WATER QUALITY

Presentations at the federal Emergency Striped Bass Study's recent annual Striped Bass Workshop had three key findings. First, the 1988 juvenile abundance indices were very low for the Maryland waters of Chesapeake Bay, somewhat higher than last year but still relatively low for the Roanoke stock, and very high for the Hudson stock and the Virginia waters of Chesapeake Bay.

Second, water quality was poor in the Choptank, Nanticoke, and Potomac Rivers, but good in upper Chesapeake Bay--findings which correlated well with the juvenile abundance indices for these areas.

Third, bioassays revealed a 100 percent mortality of larval striped bass being held in Nanticoke River water during a 20-hour period when the pH dropped from 7.2 to the low 6s and then climbed back to 7.2 again. This is the first time such acid rainfall mortality has ever been documented in the field. Contact Dr. R. Anne Richards, FTS 840-1357 or (508) 548-5123.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
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Woods Hole, Massachusetts 02543

MARCH 1989

IN THIS ISSUE:

MODEL ESTIMATES AT-SEA EXPLOITATION OF U.S. SALMON

METHOD TESTED FOR FISHERMEN TO DETERMINE SEA SCALLOP "MEAT COUNT" AT SEA

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

MODEL ESTIMATES AT-SEA EXPLOITATION OF U.S. SALMON

A mathematical model of U.S. Atlantic salmon stocks suggests that as many as 70 percent of adult U.S. salmon may be captured sometime in their life by the interception fisheries in Greenland and Canada. These interceptions occur as the fish move between their at-sea feeding grounds and their homewater spawning streams. The model, based on U.S. tag-return data, assumes two possible migration routes for the fish between the fishing areas and homewaters.

Results of the model were presented by Center scientists at a March meeting in Copenhagen, Denmark, of the International Council for the Exploration of the Sea's North Atlantic Salmon Working Group. Also presented at the meeting was a Center paper on the use of otolith (ear stone) image analysis to determine a salmon's continent of origin. These image analysis techniques are almost as accurate and certainly more cost effective than the biochemical analysis methods currently in use. Contact Dr. Kevin D. Friedland, FTS 840-1369 or (508) 548-5123.

METHOD TESTED FOR FISHERMEN TO DETERMINE SEA SCALLOP "MEAT COUNT" AT SEA

As part of the Joint Industry-Government Sea Scallop Cooperative Research Program, scientists from NMFS's Northeast Region have prepared a report which evaluates the use of a volumetric measuring device for determining sea scallop "meat counts." (Meat count refers to the number of scallop meats per pound--the current basis of scallop management.) Based on laboratory and field experiments, the report shows that meat counts determined volumetrically are as accurate and precise as meat counts determined using weight-based procedures. The report also describes a standardized volumetric sampling method, along with sampling guidelines, for scallop fishermen to determine the meat count of their catch at sea.

A limited number of copies of the report, "The Use of a Volumetric Measuring Device for Determining Sea Scallop Meat Count," are available. Contact Dr. Fredric M. Serchuk, FTS 840-1245 or (508) 548-5123, or CDR Ronald J. Smolowitz, FTS 837-9300 or (508) 281-9300.

J. Gibson

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

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APRIL 1989

IN THIS ISSUE:

"FISHERMEN'S REPORT" AVAILABLE FOR SPRING BOTTOM TRAWL SURVEY

GUIDE PUBLISHED TO NORTHEAST'S SQUIDS AND OCTOPI

SHELLFISH BIOLOGY SEMINAR HELD; FOCUS ON POLLUTANT EFFECTS

LONG ISLAND SOUND POLLUTION LINKED TO WINTER FLOUNDER EMBRYO MORTALITY

RECENT PUBLICATIONS AND REPORTS

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

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Northeast Fisheries Center

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Contact: Frederick G. Kern

"FISHERMEN'S REPORT" AVAILABLE FOR SPRING BOTTOM TRAWL SURVEY

A Fishermen's Report, based on the Center's 1989 spring bottom trawl survey, is available. The report lists the composition and size of catches for 24 commercially and recreationally important species at 299 sites between the western Scotian Shelf and Cape Hatteras. The report also includes information on the exact location (latitude & longitude and loran C bearings), tow direction, time of day, water depth, and bottom temperature of the sampling sites. This spring's survey was conducted aboard the Delaware II during February 27 -April 13.

Compared to the spring 1988 survey, this spring's survey caught fewer Atlantic cod and summer flounder. The largest catches of pollock and haddock were from the Northeast Peak of Georges Bank (Canadian waters). The largest catches of yellowtail flounder were from the offshore waters of Long Island. Catches of Atlantic herring were broadly distributed from Cape Hatteras to the Gulf of Maine.

The Fishermen's Report series is composed of three annual issues: (1&2) spring and autumn bottom trawl surveys, and (3) sea scallop survey. A Fishermen's Report is also issued after each Atlantic surf clam - ocean quahog survey which is conducted about every other year (the last one being in 1986). To subscribe to one or more of these issues, contact Linda I. Despres-Patanjo, FTS 840-1346 or (508) 548-5123.

GUIDE PUBLISHED TO NORTHEAST'S SQUIDS AND OCTOPI

A guide to the squids and octopi of the Northeast's continental shelf has been published. The guide includes: (1) an identification key (with diagnostic illustrations) to the 11 species commonly found between Nova Scotia and Cape Hatteras, (2) information on two oceanic species that are regularly swept onto the Northeast's shelf by Gulf Stream eddies and can be confused with some of the shelf species, and (3) a checklist of 89 other oceanic species and 18 more southerly shelf species that might occur occasionally on the Northeast's shelf. Contact Dr. Michael Vecchione, FTS/(202) 357-4990.

SHELLFISH BIOLOGY SEMINAR HELD; FOCUS ON POLLUTANT EFFECTS

The Center's ninth annual Shellfish Biology Seminar was recently held in Milford, Connecticut. Abstracts of the 17 talks and 7 posters are available. This year's seminar focused on coastal development and resulting pollutants on shellfish stocks and their spawning grounds. Pollutants covered in the talks included heavy metals, petroleum hydrocarbons, pesticides, herbicides, and polychlorinated biphenyls (PCBs). Also covered were effects of pathogenic bacteria and viruses as well as

parasitic crabs. Contact Dr. Walter J. Blogoslawski, FTS 642-5235 or (203) 783-4235.

LONG ISLAND SOUND POLLUTION LINKED TO WINTER FLOUNDER EMBRYO MORTALITY

Our three-year-old study of winter flounder reproduction in Long Island Sound shows increased mortality of flounder embryos the closer they are to polluted metropolitan areas. For those sites sampled during 1986-88, the shallow waters in New Haven (Connecticut) Harbor had the highest rate of embryonic mortality; the deep waters off Shoreham, New York, had the lowest rate. Contact Dr. Arlene Longwell, FTS 642-5207 or (203) 783-4207.

RECENT PUBLICATIONS AND REPORTS

Reprints of publications and copies of reports listed below are available in limited numbers by writing to the senior Center author (whose name appears in capitals) care of: Information Services Section, Northeast Fisheries Center, Woods Hole, MA 02543 USA.

Buchanan, C.C., R.B. Stone, and F.W. STEIMLE. 1988. Marine recreational boat fishery of the New York Bight apex in 1971. Mar. Fish. Rev. 50(2): 6-19.

KRZYNOWEK, J., D. D'ENTREMONT, and J. MURPHY. 1989. Proximate composition and fatty acid and cholesterol content of squid, *Loligo pealei* and *Illex illecebrosus*. J. Food Sci. 54(1): 45-48.

MACKENZIE, C.L. 1988. The winter dredge fishery for blue crabs in Raritan Bay. Underwater Nat. 17: 7-10.

SINDERMANN, C.J., ed. 1988. Environmental quality and aquaculture systems: proceedings of the Thirteenth U.S.-Japan Meeting on Aquaculture, Mie, Japan, October 24-25, 1984. NOAA Tech. Rep. NMFS 69. 50 pp.

SINDERMANN, C.J. 1989. The shell disease syndrome in marine crustaceans. NOAA Tech. Mem. NMFS-F/NEC-64. 43 pp.

STUDHOLME, A.L. 1989. Phaseout and closure of the 12-mile sewage sludge dumpsite: a case study on ecosystem response. Pages 68-92 *in* Proceedings 7th International Ocean Disposal Symposium, 12-25 Sept. 1987, Wolfville, Nova Scotia, Canada. 702 pp.

VECCHIONE, M., C.F.E. Roper, and M.J. Sweeney. 1989. Marine flora and fauna of the eastern United States: Mollusca: Cephalopoda. NOAA Tech. Rep. NMFS 73. 23 pp.

J. Gibson

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
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Woods Hole, Massachusetts 02543

MAY 1989

IN THIS ISSUE:

OXYGEN LEVELS IMPROVE AT FORMER DUMPSITE

GUIDE PREPARED ON FISH LENGTHS AT AGE

PAST NORTHERN QUAHOG RECRUITMENT FAILURE REVEALED BY SHELL GROWTH-RING ANALYSIS

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

OXYGEN LEVELS IMPROVE AT FORMER DUMPSITE

There's more evidence that the inner New York Bight's 12-Mile Dumpsite is recovering, following the end of sewage sludge dumping there in December 1987. Summertime dissolved oxygen levels at the dumpsite haven't dropped below 4.0 mg/l since the phaseout of sludge dumping began in March 1986. Prior to this period, summertime levels had dropped to less than 0.5 mg/l. This evidence of water quality improvement, combined with earlier-reported (October 1988 issue of Monthly Highlights) evidence of sediment quality improvement, gives hope for the ultimate recovery of the dumpsite's fisheries habitats.

The information on the dumpsite's dissolved oxygen levels is contained in a report on the "Response of the Habitat and Biota of the Inner New York Bight to Abatement of Sewage Sludge Dumping: Second Annual Progress Report--1988." The report also indicates that, historically, northeasterly storms have led to net transport of sediments out of the Hudson Shelf Valley and into the Hudson Canyon, and that our studies have shown recent sediment transport down the shelf valley. Copies of the report will soon be available as NOAA Technical Memorandum NMFS-F/NEC-67. Contact Robert N. Reid, FTS 342-8220 or (201) 872-3020.

GUIDE PREPARED ON FISH LENGTHS AT AGE

We've prepared "Guidelines for Estimating Lengths at Age for 18 Northwest Atlantic Finfish and Shellfish Species." This report, soon to be available for distribution as NOAA Technical Memorandum NMFS-F/NEC-66, also lists the maximum ages observed for 19 finfish species collected during the Center's bottom trawl surveys. For each species which shows significant differences in lengths at age due to differences in sex or geographical area, separate information is provided for each sex or area as available. Contact John M. (Jay) Burnett, FTS 840-1286 or (508) 548-5123.

PAST NORTHERN QUAHOG RECRUITMENT FAILURE REVEALED BY SHELL GROWTH-RING ANALYSIS

A survey of northern quahog populations off Greenwich and Milford, Connecticut, showed--through examination of shell growth-rings--that both populations have similar age distributions ranging from 1 to 50 years. There was a gap of ages 20-30 in the Greenwich population, though. This age gap appears to be recruitment failure and corresponds to a period of intense shellfishing in Greenwich. Shellfishing concentrated in Greenwich in the late 1950s to late 1960s due to closure of other shellfishing grounds for public health reasons. In contrast to Greenwich, steady recruitment occurred at Milford where fishing effort was less. Contact Ronald Goldberg, FTS 642-5246 or (203) 783-4246.

J. Albaza

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MONTHLY HIGHLIGHTS

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JUNE 1989

IN THIS ISSUE:

ASSESSMENT INFORMATION PREPARED FOR POLLOCK STOCK

NEW CATALOG FOR REGISTRY OF MARINE PATHOLOGY

SYSTEMATIC LAB'S ANNUAL REPORT AVAILABLE

CENTER ICHTHYOLOGIST RECEIVES AWARD

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

ASSESSMENT INFORMATION PREPARED FOR POLLOCK STOCK

The Center has prepared a report on "Stock Assessment Information for Pollock... in the Scotian Shelf, Georges Bank, and Gulf of Maine Regions." It will soon be available as NOAA Technical Memorandum NMFS-F/NEC-65.

The economic importance of pollock has increased in recent years as the abundance of such groundfishes as Atlantic cod, haddock, and yellowtail flounder has decreased. The annual harvest of pollock from these regions increased from about 25,000 metric tons (mt) in the late 1960s to about 65,000 mt in 1986 and 1987. Canada has accounted for about two-thirds of the harvests, the United States about one-fourth, and other countries the remaining one-twelfth.

The pollock fisheries of the past 15 years have been sustained by the recruitment of the relatively strong 1971, 1975, 1979, and 1982 year classes. Contact Ralph K. Mayo, FTS 840-1310 or (508) 548-5123.

NEW CATALOG FOR REGISTRY OF MARINE PATHOLOGY

An updated catalog of the holdings of the Registry of Marine Pathology (ROMP) has been prepared and is available upon request. The registry, established in 1975, is composed of over 500 microscope slides showing more than 400 kinds of diseased and parasitized tissue of marine fishes, mollusks, and crustaceans. These ROMP slides are particularly useful to students and practioners in pathology, toxicology, and aquaculture.

The new catalog includes over 80 new accessions since the last updating in 1981, and offers five different indices (i.e., host animal, pathogen, geographic location of collection, diagnosis, and ROMP accession number) for ease of use. In preparation is a color photographic atlas of ROMP holdings which will supplement the catalog. The registry is now in the process of being incorporated into the Smithsonian Institution's Registry of Tumors in Lower Animals. Contact Sharon A. MacLean, FTS 838-6210 or (401) 782-3200.

SYSTEMATIC LAB'S ANNUAL REPORT AVAILABLE

The National Systematics Laboratory's 1988 Annual Report is available upon request. The report focuses on a summary of the results of the laboratory's taxonomic research into marine fishes, crustaceans, squids, and corals. Also covered are identification services and scientific publications during 1988. Contact Dr. Bruce B. Collette, FTS/(202) 357-2552.

-continued-

CENTER ICHTHYOLOGIST RECEIVES AWARD

At the recent annual meeting of the American Society of Ichthyologists and Herpetologists in San Francisco, Dr. Bruce B. Collette, Director of the National Systematics Laboratory, was presented with the first Robert H. Gibbs, Jr., Memorial Award. The award is offered annually "for an outstanding body of published work in systematic ichthyology by a citizen of the Western Hemisphere." Dr. Collette has published over 130 papers including three major monographs on tunas, bonitos, and Spanish mackerels which received "best publication" awards from the Fishery Bulletin. Contact Dr. Michael Vecchione, FTS/(202) 357-2524.

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JULY 1989

IN THIS ISSUE:

NMFS-TAGGED SHARK SETS TIME-AT-LIBERTY RECORD

PREDATORS OF JUVENILE NORTHERN QUAHOGS (HARD CLAMS) IDENTIFIED

RECENT PUBLICATIONS AND REPORTS

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NMFS-TAGGED SHARK SETS TIME-AT-LIBERTY RECORD

A recent recapture of a tagged sandbar shark after more than 24 years at liberty has set a new time-at-liberty record for the NMFS Cooperative Shark Tagging Program and for any shark in the Atlantic Ocean. The male sandbar was tagged during summer 1965 in Delaware Bay by a NMFS scientist, and then recaptured this summer in the Gulf of Mexico by a commercial longliner.

When the fish was tagged, it was 52 inches long; when it was recaptured, it was 72 inches long. The average growth rate was less than one inch per year! Other tag returns have shown this species to be slow growing.

The NMFS Cooperative Shark Tagging Program has established that many species of sharks have slow growth, slow maturation, and low reproductive potential (i.e., they're live bearers), all indicating that they could be easily overfished and should be carefully managed. Contact John G. Casey, FTS 838-6320 or (401) 782-3200.

PREDATORS OF JUVENILE NORTHERN QUAHOGS (HARD CLAMS) IDENTIFIED

Juvenile mud crabs (family Xanthidae) and adults of two species of amphipods (small shrimp-like animals) appear to be major predators of juvenile northern quahogs (hard clams) during the quahogs' first week of settling. That's a finding from our study of causes of natural mortality in economically important species, particularly during the highly vulnerable early life stages.

The predatory potential of the juvenile crabs and adult amphipods upon the juvenile quahogs is exemplified by the situation in Barnegat Bay, New Jersey (prime habitat for northern quahogs). During October 1987 in the bay, we found an average of 17 juvenile mud crabs for every square meter of the bottom. In the lab, we found that these crabs each consumed at least 100 juvenile quahogs a day. Contact Clyde L. MacKenzie, FTS 342-8267 or (201) 872-3067.

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BENWAY, R.L., and J.W. JOSSI. 1989. Expendable bathythermograph observations and continuous plankton records from the NMFS/ship of opportunity program for 1988. [Nat. Mar. Fish. Serv.,] Northe. Fish. Ctr. Ref. Doc. No. 89-05. 10 pp.

BERMAN, M.S., A.L. McVey, and G. Ettershank. 1989. Age determination of Antarctic krill using fluorescence and image analysis of size. Polar Biol. 9: 267-271.

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FAHAY, M.P. 1989. The ontogeny of Steindachneria argentea Goode and Bean with comments on its relations. Pages 143-158 in D.M. Cohen, ed. Papers on the systematics of gadiform fishes. Contrib. Sci. (Los Ang.) No. 32.

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NORTHEAST FISHERIES CENTER. 1989. Report of the seventh NEFC stock assessment workshop (seventh SAW). [Nat. Mar. Fish. Serv.,] Northe. Fish. Ctr. Ref. Doc. No. 89-04. 108 pp.

PENTTILA, J., and L.M. DERY, eds. 1988. Age determination methods for Northwest Atlantic species. NOAA Tech. Rep. NMFS 72. 135 pp.

POLACHECK, T. 1989. Yellowfin tuna, Thunnus albacares, catch rates in the western Pacific. Fish. Bull., U.S. 87(1): 123-144.

ROPES, J.W. (deceased September 1988). 1989. The food habits of five crab species at Pettaquamscutt River, Rhode Island. Fish. Bull., U.S. 87(1): 197-204.

SANO, M.A., LTJG. 1989. Report of water masses receiving wastes from ocean dumping at the 106-Mile Dumpsite, 1 October 1987 through 30 September 1988, with additional summary for calendar year 1988. [Nat. Mar. Fish. Serv.,] Northe. Fish. Ctr. Ref. Doc. No. 89-06. 11 pp.

WILLIAMS, A.B., and C.A. Child. 1989. Comparison of some genera and species of box crabs (Brachyura: Calappidae), southwestern North Atlantic, with description of a new genus and species. Fish. Bull., U.S. 87(1): 105-121.

J. Colson

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
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AUGUST & SEPTEMBER 1989

IN THIS ISSUE:

NOAA AND UNIVERSITIES OF MASSACHUSETTS AND RHODE ISLAND JOIN FORCES

STOCK ASSESSMENT WORKSHOP REPORT AVAILABLE

FISHERMEN'S REPORT AVAILABLE FOR SEA SCALLOP SURVEY

NEW GENUS, TWO NEW SPECIES OF BOX CRABS

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

NOAA AND UNIVERSITIES OF MASSACHUSETTS AND RHODE ISLAND JOIN FORCES

NOAA and each of the Universities of Massachusetts (UMass) and Rhode Island (URI) have begun a formal program to share scientists and resources for studying timely marine issues. Called the Cooperative Marine Education and Research (CMER) Program in each case, the partnership with UMass is now undertaking five research projects, and with URI two projects, involving NOAA's Northeast Fisheries Center.

The NOAA/UMass CMER's five fisheries-related projects ultimately seek to: (1) reduce chances of rancidity in frozen Atlantic mackerel; (2) develop uses for wastes from mackerel processing; (3) determine if skates out-compete traditional groundfishes (e.g., haddock) for prey during early life stages; (4) understand better the spawning and early development of skates; and (5) relate movements of northern right whales to environmental conditions (e.g., water temperatures).

The NOAA/URI CMER's two fisheries-related projects involve: (1) an economic analysis of the U.S. market for blue mussels; and (2) a better understanding of the seasonal and areal changes in abundance of the coastal Gulf of Maine's *Calanus* spp. copepods, a major prey for many of the Gulf's economically important fish species. Contact Dr. John Boreman, (413) 545-2842.

STOCK ASSESSMENT WORKSHOP REPORT AVAILABLE

A report is now available on the Spring 1989 Stock Assessment Workshop. The workshop, held during April 24-27 in Woods Hole, involved 56 participants from eight state marine fisheries agencies, two regional fishery management councils, two academic institutions, two NMFS fisheries centers, one NMFS regional office, and one NOAA program office.

Included in the 122-page report are descriptions of the status of some of the region's major pelagic stocks -- butterfish, longfin squid, northern shortfin squid, and Atlantic mackerel. Special topics also covered include recent trends in water temperatures in the Northeast Continental Shelf Ecosystem, and interactions between gillnet fisheries and marine mammals. Contact Dr. Tim D. Smith, FTS 840-1251 or (508) 548-5123.

FISHERMEN'S REPORT AVAILABLE FOR SEA SCALLOP SURVEY

The Center's *Fishermen's Report* on the 1989 research vessel survey of the Northeast's sea scallop resource is available for the asking. It contains information on the total number and shell-height/meat-weight composition of sea scallops captured at each sampling site, as well as the Loran C bearings, depth, and

bottom temperature of each site. Sampling occurred at 435 sites from Cape Cod-Georges Bank to the Chesapeake Bight during June 9 through August 9. NOAA research vessels used on the survey were the Albatross IV, Chapman, and Oregon II. (Since then, the Albatross IV has been slated for decommissioning.)

To receive a copy of this issue of the Fishermen's Report, or to be placed on the mailing list for one or more of the four reports issued in this series (spring bottom trawl, autumn bottom trawl, Atlantic surf clam-ocean quahog, and sea scallop), contact Linda I. Despres-Patanjo, FTS 840-1346.

NEW GENUS, TWO NEW SPECIES OF BOX CRABS

Exploratory trawling with the old Bureau of Commercial Fisheries research vessels Pelican, Combat, Silver Bay, and Oregon, and with the NOAA research vessel Oregon II, yielded large collections of decapod crustaceans which were stored at the National Museum of Natural History. Recent study of those crustaceans has produced one genus (Cyclozodion) and two species of box crabs (family Calappidae) in the Northwest Atlantic new to science. Contact Dr. Austin B. Williams, FTS/(202) 357-2639.

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MONTHLY HIGHLIGHTS

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NOVEMBER 1989

IN THIS ISSUE:

NORTHERN SHRIMP LANDINGS SHOULD INCREASE

PROCEEDINGS OF BOTTOM TRAWL SURVEY WORKSHOP AVAILABLE

SURVEY SHOWS SUMMER DISTRIBUTION OF GULF-OF-MAINE HARBOR PORPOISES

FISHERMEN'S REPORT AVAILABLE FOR AUTUMN BOTTOM TRAWL SURVEY

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

NORTHERN SHRIMP LANDINGS SHOULD INCREASE

Abundance of northern shrimp (Pandalus borealis) in the Gulf of Maine has sharply increased due to recruitment of the strong 1987 year class. Those are the results of a recent stock assessment by federal and state scientists on the Atlantic States Marine Fisheries Commission's Northern Shrimp Technical Committee. Consequently, landings during the upcoming winter fishery (December 1989 through May 1990) should increase over those during last winter's fishery.

The 1988 and 1989 surveys of northern shrimp abundance in the Gulf of Maine (which used the Center's inshore research vessel Gloria Michelle) yielded significant catches of the 1987 year class. The recent assessment also appears to show relatively low fishing mortality in the past few years. Contact Dr. Stephen H. Clark, FTS 840-1312 or (508) 548-5123.

PROCEEDINGS OF BOTTOM TRAWL SURVEY WORKSHOP AVAILABLE

The proceedings of a bottom trawl survey workshop held in Woods Hole, Mass., during 1-3 November 1988 are now available. Included in the workshop proceedings are descriptions of the 1 federal, 2 state-federal, and 14 state survey programs along the Atlantic Coast. Also included are summaries of discussions on survey design, sampling gear & techniques, data analyses & applications, and coordination & cooperation of survey programs. Contact Thomas R. Azarovitz, FTS 840-1283 or (508) 548-5123.

SURVEY SHOWS SUMMER DISTRIBUTION OF GULF-OF-MAINE HARBOR PORPOISES

To estimate the population size of the Gulf of Maine's harbor porpoises, the Center is studying both the summer distribution of the population and the best methods of abundance estimation. Preliminary analysis of data gathered during a 17-28 July 1989 cruise of the NOAA research vessel Chapman as part of this harbor porpoise study shows the summer distribution to be in inshore waters from Machias to Penobscot Bay, along the Nova Scotian coast, on Grand Manan Banks, and in offshore waters up to 840 feet deep off the northern Maine coast. No harbor porpoises were sighted west of Penobscot Bay or on the more southerly offshore banks and ledges. Contact Dr. Thomas Polacheck, FTS 840-1397 or (508) 548-5123.

FISHERMEN'S REPORT AVAILABLE FOR AUTUMN BOTTOM TRAWL SURVEY

A Fishermen's Report, based on the Center's 1989 autumn bottom trawl survey, is available free of charge. The report lists the composition and size of catches of 24 commercially

and/or recreationally important species at 329 sites between the western Scotian Shelf and Cape Hatteras. The report also includes information on the exact location (latitude & longitude and Loran C bearings), tow direction, time of day, water depth, and bottom temperature of the sampling sites. This autumn's survey was conducted aboard the NOAA research vessel Delaware II during 11 September - 2 November.

The Fishermen's Report series is composed of four reports: the spring and autumn bottom trawl surveys, the surf clam - ocean quahog survey, and the sea scallop survey. Anyone wishing to subscribe to one or all of these reports should write to Linda I. Despres-Patanjo, National Marine Fisheries Service, Woods, MA 02543, or call FTS 840-1346 or (508) 548-5123.

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DECEMBER 1989

IN THIS ISSUE:

STOCK ASSESSMENT WORKSHOP REPORT AVAILABLE; SIGNIFICANT FINDINGS FOR HERRING AND SURFCLAM FISHERIES

2ND WINTER FLOUNDER BIOLOGY WORKSHOP HELD; ABSTRACTS AVAILABLE

NEW LIST OF NAMES FOR DECAPOD CRUSTACEANS

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

STOCK ASSESSMENT WORKSHOP REPORT AVAILABLE; SIGNIFICANT FINDINGS FOR HERRING AND SURFCLAM FISHERIES

A report on the Center's Fall 1989 Stock Assessment Workshop is available. Covered in the report are various aspects of the populations of, fisheries for, and/or research on Atlantic cod, Atlantic herring, Atlantic surfclams, black sea bass, haddock, pollock, scup, sea scallops, and summer flounder. The workshop was held in Falmouth, Mass., during 27 Nov. - 1 Dec. Sixty-eight individuals from federal, regional, state, and academic organizations participated.

Two of the more important results of the workshop were that: (1) the biomass of spawning aged/sized Atlantic herring in the Gulf of Maine has recovered to levels last seen in the late 1960s; and (2) the existing populations of surfclams in the mid-Atlantic region can support current catch levels well into the 1990s, but catch rates will likely decline slowly as strong year classes--first off New Jersey, then off Delmarva--are fished down. Contact Anne T. Lange, FTS 840-1301 or (508) 548-5123.

2ND WINTER FLOUNDER BIOLOGY WORKSHOP HELD; ABSTRACTS AVAILABLE

The Center held its Second Winter Flounder Biology Workshop on 5 and 6 Dec. in Mystic, Conn. Coverage included habitat issues, physiology, migration patterns, reproductive success, disease, growth & development, and pollutant effects. Limited copies of the program and abstracts are available. Contact Dr. Anthony Calabrese, FTS 642-5209 or (203) 783-4209.

NEW LIST OF NAMES FOR DECAPOD CRUSTACEANS

A list of scientific and common names of decapod crustaceans (shrimps, lobsters, and crabs) of the United States and Canada has been issued by the American Fisheries Society (AFS) as a companion volume to their lists on fishes and mollusks. All freshwater species known in North America north of Mexico, and all marine species known from waters within 320 km of the United States and Canada are included; coastal islands are covered, but not the West Indies.

The AFS list contains 1,614 species whose occurrence in the region has either been authenticated in published accounts or verified in established research collections. Selected species are illustrated in color. Development of this publication was chaired by Dr. Austin B. Williams of NMFS's National Systematics Laboratory which is administered by the Center. Inquiries about the publication should be directed to: AFS, 5410 Grosvenor Ln.-Suite 110, Bethesda, MD 20814.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
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JANUARY 1990

IN THIS ISSUE:

1989 STATUS-OF-THE-STOCKS REPORT ISSUED

SEA SCALLOP & GOOSEFISH LANDINGS HIT RECORD HIGHS IN 1989

RECENT PUBLICATIONS AND REPORTS

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

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1989 STATUS-OF-THE-STOCKS REPORT ISSUED

The Center has issued the 1989 edition of its annual "Status of the Fishery Resources Off the Northeastern United States." In addition to sections detailing the population status of 33 species or species groupings, the report also includes sections on trends in: (1) commercial and recreational fisheries landings; (2) commercial fisheries economics; and (3) four broad categories of resources--principal groundfish and flounders (Atlantic cod, yellowtail flounder, etc.), principal pelagics (Atlantic mackerel and Atlantic herring), other finfish (white hake, butterfish, etc.), and skates and spiny dogfish.

A limited number of single copies are available on first-come, first-served basis. For information on contents of the report, contact Dr. Tim D. Smith, FTS 840-1251 or (508) 548-5123; for copies of the report itself, write Lynn Forbes, Information Services Section, Northeast Fisheries Center, Woods Hole, MA 02543 USA.

SEA SCALLOP & GOOSEFISH LANDINGS HIT RECORD HIGHS IN 1989

Landings of sea scallops and goosefish (monkfish, angler) in the Northeast (Maine through Virginia) during 1989 set all-time record highs. Scallop landings were 31.6 million pounds worth 125.7 million dollars in dockside value. Goosefish landings were 24.8 million pounds worth 11.8 million dollars. Other species whose landings increased in 1989 were Atlantic cod, silver hake (whiting), yellowtail flounder, swordfish, and northern shrimp. Although landings of white hake decreased in 1989, their value nonetheless increased. Atlantic cod was the most landed seafood species in 1989, replacing Atlantic herring which dropped from first to second.

The table on the next page lists the landings and values of 15 fish and invertebrate species in the Northeast for 1988 and 1989. For comparison only, the all-time record landings (and year in which they occurred) are also listed for these species. All figures are in millions. Contact Ronnee L. Schultz, FTS 840-1264 or (508) 548-5123.

(cont.)

Species	1988 Pounds	1988 Dollars	1989 Pounds	1989 Dollars	Record Pounds (Year)
Atlantic cod	75.4	42.6	76.3	44.1	294 (1880)
Atlantic herring	89.1	5.2	73.7	4.4	201 (1902)
Silver hake (whiting)	35.2	8.5	37.9	9.4	134 (1957)
Sea scallop	28.3	120.0	31.6	125.7	32 (1989)
Goosefish (monkfish, angler)	16.6	10.1	24.8	11.8	25 (1989)
Pollock (Boston bluefish)	33.1	11.0	22.5	10.7	54 (1986)
Winter flounder (lemon sole, blackback)	17.6	21.4	14.3	20.5	35 (1981)
Summer flounder (fluke)	24.3	31.6	12.6	20.9	32 (1979)
Yellowtail flounder	9.3	11.1	11.2	14.5	83 (1963)
White hake	10.5	3.2	8.8	3.4	40 (1898)
Northern shrimp	6.8	7.5	7.4	7.6	29 (19[illegible])
Scup (porgy)	11.6	7.6	7.1	5.9	49 (1[illegible])
Swordfish	5.6	16.6	6.3	17.6	7 (1929)
Haddock	6.5	7.0	3.8	4.4	294 (1929)
Redfish (ocean perch)	2.4	1.5	1.2	0.8	258 (1951)

RECENT PUBLICATIONS AND REPORTS

Reprints of publications and copies of reports listed below are available in limited numbers by writing to the senior Center author (whose name appears in capitals) care of: Information Services Section, Northeast Fisheries Center, Woods Hole, MA 02543 USA.

ALMEIDA, F.P., T.S. BURNS, and S. CHANG. 1989. The 1988 experimental whiting fishery: a NMFS/industry cooperative program. NOAA [Nat. Ocean. Atmos. Admin.] Tech. Mem. NMFS [Nat. Mar. Fish. Serv.]-F/NEC-69. 16 pp.

[CONSERVATION & UTILIZATION DIVISION, NORTHEAST FISHERIES CENTER.] 1989. Report of the Fall 1989 Stock Assessment Workshop (Ninth SAW). [Nat. Mar. Fish. Serv.,] Northeast Fish. Ctr. Ref. Doc. No. 89-08. 71 pp.

CONSERVATION & UTILIZATION DIVISION, NORTHEAST FISHERIES CENTER. 1989. Status of the fishery resources off the northeastern United States for 1989. NOAA [Nat. Ocean. Atmos. Admin.] Tech. Mem. NMFS [Nat. Mar. Fish. Serv.]-F/NEC-72. 110 pp.

ENVIRONMENTAL PROCESSES DIVISION, NORTHEAST FISHERIES CENTER. 1989. Response of the habitat and biota of the inner New York Bight to abatement of sewage sludge dumping: second annual progress report--1988. NOAA [Nat. Ocean. Atmos. Admin.] Tech. Mem. NMFS [Nat. Mar. Fish. Serv.]-F/NEC-67. 47 pp.

MAYO, R.K., J.M. McGlade, and S.H. CLARK. 1989. Patterns of exploitation and biological status of pollock (Pollachius virens L.) in the Scotian Shelf, Georges Bank, and Gulf of Maine area. J. Northwest Atl. Fish. Sci. 9(1): 5-11.

SANO, M.H., and C.P. Fairfield. 1989. Evaluations of differences in sea surface temperatures between 1987 and 1988 for use in study of sea turtle strandings along the southeast U.S. coast. [Nat. Mar. Fish. Serv.,] Northeast Fish. Ctr. Ref. Doc. No. 89-09. 28 pp.

STEIMLE, F.W. 1990. Benthic macrofauna and habitat monitoring on the continental shelf of the northeastern United States. I. Biomass. NOAA [Nat. Ocean. Atmos. Admin.] Tech. Rep. NMFS [Nat. Mar. Fish. Serv.] 86. 28 pp.

WILLIAMS, A.B. (Chair.), L.G. Abele, D.L. Felder, H.H. Hobbs, Jr., R.B. Manning, P.A. McLaughlin, and I. PEREZ FARFANTE. 1989. Common and scientific names of aquatic invertebrates from the United States and Canada: decapod crustaceans. Amer. Fish. Soc. Spec. Pub. 17. 77 pp.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
National Oceanic and Atmospheric Administration
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FEBRUARY 1990

IN THIS ISSUE:

CRUSTACEAN SHELL DISEASE MAY BE AGGRAVATED BY ENVIRONMENTAL STRESS

TEMPERATURE TRENDS IN NORTHEAST WATERS DOCUMENTED

POTENTIAL MIXING OF MAINE AND NOVA SCOTIAN HERRING LARVAE IN THE GULF OF MAINE

SHELLFISH BIOLOGY SEMINAR HELD; ABSTRACTS AVAILABLE

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

CRUSTACEAN SHELL DISEASE MAY BE AGGRAVATED BY ENVIRONMENTAL STRESS

About two years ago, when sewage sludge dumping shifted from the 12-Mile Dumpsite in the New York Bight apex to the 106-Mile Dumpsite beyond the continental shelf-slope margin, many offshore lobstermen and deepsea red crabbers in the vicinity of the 106-Mile Dumpsite felt that there was a significant increase in the prevalence and severity of shell disease in their catches. Shell disease is characterized by darkening, pitting, even penetration of the exoskeleton of these crustaceans. While there is no evidence that the disease affects the wholesomeness of these animals as seafood, it may affect their marketability due to discoloration/disfiguration, and conceivably it may affect their population distribution, abundance, and productivity.

The Center has just issued two reports on this topic. The first report, "Shell Disease of Crustaceans in the New York Bight" (NOAA Technical Memorandum NMFS-F/NEC-74), emanated from a joint NOAA and U.S. Environmental Protection Agency-sponsored scientific working group composed of federal, state, and university scientists. The report finds that: (1) shell disease is a natural phenomenon; (2) its prevalence and severity, however, may be greater in polluted or stressful habitats, suggesting that various stresses, including pollution, can trigger and/or aggravate the disease; and (3) there aren't enough data yet to determine if or how much the disease has population-level effects.

The second report, "Shell Disease among Red Crabs Inhabiting Submarine Canyons of the New York Bight" (NOAA Technical Memorandum NMFS-F/NEC-77), finds shell disease prevalence to be 92, 92, and 86 percent, respectively, among crabs in Hudson, Block, and Atlantis Canyons. A comparison of specimens collected in 1988 with those collected in 1884 and subsequently stored in the Smithsonian Institution shows that shell disease also occurred more than a century ago. Copies of either report are available upon written request to: Information Services Section, Northeast Fisheries Center, Water St., Woods Hole, MA 02543. Technical inquiries on shell disease should be directed to: Dr. Carl J. Sindermann, (301) 226-5193.

TEMPERATURE TRENDS IN NORTHEAST WATERS DOCUMENTED

A report on "Surface and Bottom Temperature Distributions from the Northeast Fisheries Center Spring and Fall Bottom Trawl Survey Program, 1963-1987," has been issued as Northeast Fisheries Center Reference Document 90-03. The report shows that, in general, water temperatures in the 1960s were quite cold, in the early to mid-1970s were warmer, in the late 1970s to early 1980s were intermediate between the two previous extremes, and in the mid-1980s were warm again. These data have important applications in fisheries ecology and management. (continued)

Copies of the report are available upon written request to: Information Services Section, Northeast Fisheries Center, Water St., Woods Hole, MA 02543. Technical inquiries on water temperatures should be directed to: Dr. David G. Mountain, FTS 840-1271 or (508) 548-5123.

POTENTIAL MIXING OF MAINE AND NOVA SCOTIAN HERRING LARVAE IN THE GULF OF MAINE

Preliminary estimates from an early January survey throughout the Gulf of Maine show that 95 percent of the gulf's larval Atlantic herring are concentrated from Mt. Desert Island, Maine, across the gulf to the southeastern Scotian Shelf. This distribution of larval herring suggests a potential mixing and interchange of larvae which will ultimately produce spawners either along the Maine coast or the Nova Scotia coast. The findings imply that U.S. and Canadian herring fisheries can have some effect on each other.

The survey was a cooperative effort among the Center, University of Rhode Island, and Bigelow Laboratory of Ocean Science (West Boothbay Harbor, Maine). Contact John R. Green, FTS 838-6240 or (401) 782-3240, or Jerome Prezioso, FTS 838-3277 or (401) 782-3277.

SHELLFISH BIOLOGY SEMINAR HELD; ABSTRACTS AVAILABLE

The Center held its 10th Shellfish Biology Seminar on 27 February in Milford, Conn. Over 140 shellfish biologists from 12 states attended the seminar. Coverage included adverse impacts of toxic algal blooms, marina use for aquaculture, new culture methods, and genetic selection for disease control. Copies of the program and abstracts are available. Contact Dr. Walter J. Blogoslawski, FTS 642-5235 or (203) 783-4235.

J. Colson

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
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MARCH 1990

IN THIS ISSUE:

GLOUCESTER, MASS., TOP NEW ENGLAND PORT IN '89 LANDINGS; DETAILED LANDINGS & VALUES FIGURES AVAILABLE

EFFECTS OF CONTAMINATED SITES ON WINTER FLOUNDER REPRODUCTION DOCUMENTED

INDO-PACIFIC CRAB REPORTED FROM NEW JERSEY

LEAFLET AVAILABLE ON NUTRITIONAL CONSTITUENTS OF SEAFOOD SPECIES

NEW MARINE MAMMAL INVESTIGATION IN CENTER

MARINE FISHERIES REVIEW 50 YEARS OLD; SPECIAL ISSUE ON HISTORY OF MARINE FISHERIES

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GLOUCESTER, MASS., TOP NEW ENGLAND PORT IN '89 LANDINGS; DETAILED LANDINGS & VALUES FIGURES AVAILABLE

Preliminary figures for 1989 show Gloucester, Mass., again leading other New England fishing ports in annual landings with a total of 99 million pounds. These 1989 landings for Gloucester were down, though, by 9 million pounds from 1988. New Bedford, Mass., again led in value with landings worth $141 million in dockside, or "ex-vessel," prices -- virtually the same level as last year.

For New England as a whole, 1989 landings were down by 5 million pounds, but up by $15 million. Preliminary figures for total New England landings and values by state, port, and species, as well as for lobster landings by state, are available upon written request to: Information Services Section, Northeast Fisheries Center, Woods Hole, MA 02543. For other information on fisheries statistics in the New England and/or Mid-Atlantic area, contact Ronnee L. Schultz, FTS 840-1264 or (508) 548-5123.

EFFECTS OF CONTAMINATED SITES ON WINTER FLOUNDER REPRODUCTION DOCUMENTED

The Center has issued a report on "A Three-Year Assessment of Reproductive Success in Winter Flounder...in Long Island Sound, with Comparisons to Boston Harbor: 1986-88." The report finds that "general site contamination appears to be associated with the occurrence and severity of pathological effects...throughout the life cycle: adults, eggs, embryos, larvae, and juveniles."

The six sites where adult winter flounder were collected in Long Island Sound were Norwalk, Milford, New Haven, and Madison, Conn., and Hempstead and Shoreham, N.Y.; the two sites in Boston Harbor were Deer Island and "Long" Island. The most adverse effects in adult spawners were seen at the two Boston Harbor sites; the greatest effects in embryos and larvae were observed at the New Haven site.

Copies of the report are available. Contact Dr. Anthony Calabrese, FTS 642-5209 or (203) 783-4209.

INDO-PACIFIC CRAB REPORTED FROM NEW JERSEY

An egg-bearing female of a western Pacific crab, *Hemigrapsis sanguineus*, was found in the Cape May, N.J., area this past September by a Franklin and Marshall College biology student. This crab species, a noncommercial "shore" crab, is one of the commonest crabs in Japan, and is known from Sakhalin, Korea, and China south to Hong Kong. Larvae from the captured crab were reared through the early life stages. (cont.)

It's not known whether this capture represents a freak capture of the only individual of this exotic species, or the first capture from an established population. If the latter, it's not known what ecological effect this exotic species might have on the Northeast's tidal community. The Cape May area should be monitored for the occurrence of this species. Contact Dr. Austin B. Williams, FTS/(202) 357-2639.

LEAFLET AVAILABLE ON NUTRITIONAL CONSTITUENTS OF SEAFOOD SPECIES

The Center has issued an information leaflet on "The Seafood Way to a Healthy Heart." The one-page leaflet includes a listing of the cholesterol, fat, and Omega-3 content in cooked, four-ounce portions of 27 Northeast seafood species/products. (Omega-3 is a category of polyunsaturated fatty acids which are found in fish oils and which have a therapeutic effect in the prevention of heart disease.)

The leaflet is the first in a series of informational leaflets to be issued by the Center which will summarize the practical applications and implications of Center research findings to current popular concerns. For copies of the leaflet, write: Information Services Section, Northeast Fisheries Center, Woods Hole, MA 02543. For further information on Center research on nutritional constituents of seafood species/products, contact Judith Krzynowek, FTS 837-9226 or (508) 281-9226.

NEW MARINE MAMMAL INVESTIGATION IN CENTER

A new Marine Mammal Investigation has been established by the Center and assigned to the Fisheries Ecology Division. The Center has been conducting marine mammal studies, largely through contracts with academic and private research institutions, for years. Increasingly frequent and more comprehensive requests by resource and environmental managers for marine mammal information, however, have prompted the elevation of these studies into a formal investigation.

The new investigation's research will focus on: (1) the indirect interactions between marine mammals and commercially and recreationally important fish stocks through competition for space and food; (2) the incidental take of marine mammals during fishing operations, and the effects on whale populations of whale watching operations; and (3) the current status of Northwest Atlantic marine mammal populations. Contact Dr. Tim D. Smith, FTS 840-1251 or (508) 548-5123.

"MARINE FISHERIES REVIEW" 50 YEARS OLD; SPECIAL ISSUE ON HISTORY OF MARINE FISHERIES

The 50th anniversary issue of Marine Fisheries Review (formerly Fishery Market News and Commercial Fisheries Review) has just been released. In commemoration of this anniversary, the issue appropriately focuses on a single topic -- the history of marine fisheries, fisheries science, and fisheries management. The collection of articles and notes may well be the most extensive description of this field available. This issue of MFR includes thorough coverage of the Center's Woods Hole Laboratory Centennial in 1985. Copies (Volume 50, Issue 4) are available for $5.50 (U.S.) from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Contact Roger B. Theroux, FTS 840-1253 or (508) 548-5123.

J. Gibson

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS

United States Department of Commerce
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APRIL 1990

IN THIS ISSUE:

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BOTTOM TRAWL SURVEY CATCHES UP; "FISHERMEN'S REPORT" AVAILABLE

SLOPE WATER RECEIVES BULK OF SEWAGE SLUDGE DUMPING

NEW YORK BIGHT AND LONG ISLAND SOUND PROBLEMS RANKED

RECENT PUBLICATIONS AND REPORTS

The Northeast Fisheries Center's Monthly Highlights is an administrative report on key Center research activities during the month. The report focuses on the practical applications of research findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each research highlight to contact for more information.

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CAPE MAY/WILDWOOD, N.J., TOP MIDDLE ATLANTIC PORT IN '89 LANDINGS & VALUES; DETAILED FIGURES AVAILABLE

For 1989, Cape May/Wildwood, N.J., again led other Middle Atlantic and Chesapeake ports in annual landings, and replaced Hampton Roads, Va., as the leader in value. The southern New Jersey port landed 54.0 million pounds worth $30.8 million in dockside or "ex-vessel" prices. For the Middle Atlantic - Chesapeake area as a whole, 1989 landings were up seven percent, from 890.7 to 949.2 million pounds, and value was up one percent, from $281.8 to $285.3 million.

Detailed figures for total Middle Atlantic - Chesapeake landings and values by state, port, and species, as well as for Atlantic surfclam landings by state, are available upon written request to: Information Services Section, Northeast Fisheries Center, Woods Hole, MA 02543. For other information on fisheries statistics in the Middle Atlantic or New England area, contact Ronnee L. Schultz, FTS 840-1264 or (508) 548-5123.

BOTTOM TRAWL SURVEY CATCHES UP; "FISHERMEN'S REPORT" AVAILABLE

The Center's 1990 spring bottom trawl survey caught 25,000 pounds more fish than last spring's survey. The increase was due almost exclusively to spiny dogfish. Other species with significantly increased catches were Atlantic mackerel, ocean pout, and white hake. Atlantic cod, haddock, and yellowtail flounder catches were also higher. The largest catches of pollock and haddock were from the Northeast Peak of Georges Bank (Canadian waters).

A Fishermen's Report, based on the spring survey, is available by writing to: Resource Surveys Investigation, Northeast Fisheries Center, Woods Hole, MA 02543. The report lists catches by weight for 24 commercially and recreationally important species at 322 sites between the western Scotian Shelf and Cape Hatteras. The report includes information on location (latitude & longitude bearings and LORAN C line of positions), tow direction, time of day, water depth, and bottom temperature of the sampling sites. This spring's survey was conducted aboard the NOAA R/V Delaware II during 5 March - 18 April. Contact Linda I. Despres-Patanjo, FTS 840-1346 or (508) 548-5123.

SLOPE WATER RECEIVES BULK OF SEWAGE SLUDGE DUMPING

Sewage sludge dumping at the 106-Mile Site off New Jersey/New York began in 1986 commensurate with the phase-out of sludge dumping at the 12-Mile Site. Concerns over the fates and effects of the sludge at the 106-Mile Site have heightened, in part, because of reports by fishermen and scientists (see February 1990

issue of "Monthly Highlights") of increased shell disease in American lobsters and red deepsea crabs in the vicinity of the deepwater dumpsite.

The fate of the sludge is largely determined by which of the three water masses that alternately occupy the site actually receive the sludge. Using NOAA satellite infrared temperature data and EPA sludge dumping records, Center scientists have determined the amounts of sludge dumped into each water mass during 1989:

Water Mass	Amount Dumped (million gallons)	Percent
Shelf water	152.6	8.7
Slope water	1,425.6	81.5
Gulf Stream/warm-core ring water	171.6	9.8

Slope water, which received 81.5 percent of the sludge, is the water mass normally occupying the submarine canyons where the Mid-Atlantic's offshore lobster and crab fisheries primarily take place. For information on water masses receiving sludge dumping, contact Lt. Margaret Sano, FTS 838-6290 or (401) 782-3290. For information on shell disease in offshore crustaceans, contact Dr. Carl J. Sindermann, FTS/(301) 226-5193.

NEW YORK BIGHT AND LONG ISLAND SOUND PROBLEMS RANKED

For Long Island Sound, the New York - New Jersey harbors, and the New York Bight, the most pressing problems are: nutrient/organic enrichment in the sound, pathogens in the harbors, floatables in the harbors and bight, toxics in the harbors and systemwide, and habitat alterations in all three areas and systemwide. That's the consensus of government (including the Center), industry, academia, and the public participating in an EPA-sponsored conference, "Cleaning Up Our Coastal Waters: An Unfinished Agenda," held at Manhattan College during 12-14 March.

Other problems mentioned by conference participants were overfishing, spills, solid waste disposal, inadequate public access, growth & development, and aesthetic deterioration. Participants also developed a preliminary list of research and management needs to address these problems. Conference proceedings will be published soon. Contact Robert N. Reid, FTS 342-8220 or (201) 872-3020.

RECENT PUBLICATIONS AND REPORTS

Unless otherwise indicated, single copies of the publications and reports listed below are available--subject to supply--by writing to: Information Services Section, Northeast Fisheries Center, Woods Hole, MA 02543 USA.

ALMEIDA, F.P., S. CHANG, and T.S. BURNS. 1989. Summer distribution of regulated species on Georges Bank with reference to the 1988 experimental whiting fishery. NOAA [Nat. Ocean. Atmos. Admin.] Tech. Mem. NMFS [Nat. Mar. Fish. Serv.]-F/NEC-70. 25 pp.

DESPRES-PATANJO, L.I., T.R. AZAROVITZ, and C.J. BYRNE. 1988. Twenty-five years of fish surveys in the Northwest Atlantic: the NMFS Northeast Fisheries Center bottom trawl survey program. Pages 69-71 in R.B. Theroux, ed. The Woods Hole Laboratory, 1885-1985: a century of service. Mar. Fish. Rev. 50(4).

EDWARDS, R.L. 1988. Centennial lecture I: history and contributions of the Woods Hole Laboratory. Pages 13-17 in R.B. Theroux, ed. The Woods Hole Laboratory, 1885-1985: a century of service. Mar. Fish. Rev. 50(4).

HOLZWARTH, T., and D. MOUNTAIN. 1990. Surface and bottom temperature distributions from Northeast Fisheries Center spring and fall bottom trawl survey program, 1963-1987. [Nat. Mar. Fish. Serv.,] Northeast Fish. Ctr. Ref. Doc. No. 90-03. 62 pp.

MANNING, J., and T. HOLZWARTH. 1990. Descriptions of oceanographic conditions on the Northeast Continental Shelf: 1977-1985. [Nat. Mar. Fish. Serv.,] Northeast Fish. Ctr. Ref. Doc. No. 90-04. 373 pp.

MUNROE, T.A. 1990. Symphurus melanurus Clark, 1936, a senior synonym for the eastern Pacific tonguefishes, S. seychellensis Chabanaud, 1955, and S. sechurae Hildebrand, 1946. Copeia 1990(1): 229-232.

POLACHECK, T., T. SMITH, and G. WARING. 1990. Review of methods for assessing the status of the harbor porpoise population in the Gulf of Maine and Bay of Fundy region. [Nat. Mar. Fish. Serv.,] Northeast Fish. Ctr. Ref. Doc. No. 90-01. 10 pp.

[Joint NOAA/EPA Working Group:] SINDERMANN, C.J. (chair.), F. Csulak (EPA coord.), T.K. Sawyer (rapp.), R.A. Bullis, D.W. Engel, B.T. Estrella, E.J. Noga, J.B. PEARCE, J.C. RUGG, R. Runyon, J.A. Tiedemann, and R.R. Young. 1989. Shell disease of crustaceans in the New York Bight. NOAA [Nat. Ocean. Atmos. Admin.] Tech. Mem. NMFS [Nat. Mar. Fish. Serv.]-F/NEC-74. 47 pp.

THEROUX, R.B. 1988. Forward and acknowledgments. Pages 3-12 in R.B. Theroux, ed. The Woods Hole Laboratory, 1885-1985: a century of service. Mar. Fish. Rev. 50(4).

THEROUX, R.B., ed. 1988. The Woods Hole Laboratory, 1885-1985: a century of service. Mar. Fish. Rev. 50(4): 1-68.

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WILLIAMS, A.B., and J.T. McDermott. 1990. An eastern United States record for the western Indo-Pacific crab, Hemigrapsis sanguineus (Crustacea: Decapoda: Grapsidae). Proc. Biol. Soc. Wash. 103(1): 108-109.

Young, R.R. 1989. Shell disease among red crabs inhabiting submarine canyons of the New York Bight. NOAA [Nat. Ocean. Atmos. Admin.] Tech. Mem. NMFS [Nat. Mar. Fish. Serv.]-F/NEC-77. 9 pp.

ZDANOWICZ, V.S., M.C. INGHAM, and S. LEFTWICH. 1990. Monitoring the effects of sewage sludge disposal at the 106-Mile Dumpsite using mid-water fish as sentinels of contaminant metal uptake: a feasiblity study. [Nat. Mar. Fish. Serv.,] Northeast Fish. Ctr. Ref. Doc. No. 90-02. 6 pp.

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