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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.)

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).

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).
