

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

JANUARY 1987

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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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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.
- Hanson, P.J., J.A. Wells, and M.W. NEWMAN. 1986. Preliminary results of the 1984-85 National Benthic Surveillance Project: southeast Atlantic and Gulf of Mexico coasts. Proc. Oceans '86 Conf. 572-577.

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- MAYO, R.K. 1986. Recent exploitation patterns and future stock rebuilding strategies for Acadian redbfish, *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.

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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.

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, pre-hatch 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.

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NATIONAL FISHING WEEK IS JUNE 1-7

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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



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 of 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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MARYLAND TO SHARE USE OF OXFORD LABORATORY

PRELIMINARY FINDINGS ASSOCIATE SEDIMENT CONTAMINANTS WITH FISH LESIONS

FOURTH STOCK ASSESSMENT WORKSHOP HELD

SALMON WORKING GROUPS ADDRESS ACID RAIN AND INTERCEPTION ISSUES

GULF STREAM MEANDER AFFECTS LOBSTER AND CRAB FISHERMEN

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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 completed 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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Chenoweth, J.F., S.E. McGladdery, C.J. SINDERMANN, T.K. SAWYER, and J.W. Bier. 1986. An investigation into the usefulness of parasites as tags for herring (*Clupea harengus*) stocks in the western North Atlantic, with emphasis on the use of the larval nematode *Anisakis simplex*. J. Northw. Atl. Fish. Sci. 7:25-33.

COLLETTE, B.B. 1987. Review of S.R. Edwards, G.M. Davis, and L.I. Nevling. The systematics community. Copeia 1987(1):261-264.

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- FARLEY, C.A., S.V. Otto, and C.L. Reinisch. 1986. New occurrence of epizootic sarcoma in Chesapeake Bay soft shell clams, *Mya arenaria*. Fish. Bull., U.S. 84:851-857.
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- SERCHUK, F.M. and S.E. WIGLEY. 1986. Assessment and status of the Georges Bank and Gulf of Maine Atlantic cod stocks - 1986. Woods Hole Lab. Ref. Doc. No. 86-12. 84 pp.
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- WILLIAMS, A.B. 1986. More records for shrimps of the genus *Rimiraris* (Decapoda: Bresiliidae) from the Mid-Atlantic Rift. J. Crustacean Biol. 7(1):105.
- WONGRATANA, T. 1987. Four new species of clupeoid fishes (Clupeidae and Engraulidae) from Australian waters. Proc. Biol. Soc. Wash. 100(1):104-111.
- WONGRATANA, T. 1987. Two new species of anchovies of the genus *Stolephorus* (Engraulidae), with a key to species of *Engraulis*, *Encrasicholina*, and *Stolephorus*. Amer. Mus. Novit. 2876:1-8.

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 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 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.

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.

NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS



J. Brownlow
United States Department of Commerce
National Oceanic and Atmospheric Administration
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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-borne 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.

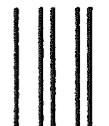
FOUNDER AND 31-YEAR DIRECTOR OF MILFORD LABORATORY DIES

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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MONTHLY HIGHLIGHTS



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JULY 1987

IN THIS ISSUE:

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BLUEFIN TUNA AGING TO BECOME MORE RELIABLE

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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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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 admissible 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.

RECENT PUBLICATIONS AND REPORTS

- ALMEIDA, F.P. 1987. Status of the silver hake resource off the northeast coast of the United States -- 1987. Woods Hole Lab. Ref. Doc. No. 87-03. 60 pp.
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J. Brownlow
NORTHEAST FISHERIES CENTER

**MONTHLY
HIGHLIGHTS**



United States Department of Commerce
National Oceanic and Atmospheric Administration
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Northeast Fisheries Center
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AUGUST 1987

IN THIS ISSUE:

FISHERMEN'S REPORT AVAILABLE FOR SEA SCALLOP SURVEY

NORTHERN SHRIMP ABUNDANCE AND BIOMASS DECREASED IN GULF OF MAINE

BOTTLENESED DOLPHIN SURVEY CONDUCTED; HARBOR PORPOISE SURVEY METHODS EVALUATED

FRESH/FROZEN STORAGE CHARACTERISTICS OF WINTER SKATE WINGS EXAMINED

LARGE MARINE ECOSYSTEMS CATEGORIZED BY FORCES PRINCIPALLY CONTROLLING THEIR FISH STOCK DOMINANCE

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 ECOSYSTEMS 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.

J. Braunlow
NORTHEAST FISHERIES CENTER

**MONTHLY
HIGHLIGHTS**



United States Department of Commerce
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SEPTEMBER 1987

IN THIS ISSUE:

CONVERTED FISH PROCESSING WASTES OUTPERFORM COMMERCIAL PLANT FERTILIZER

MACKEREL SPAWNING MORE CONCENTRATED NORTH OF BORDER

CHRONICALLY LOW OXYGEN REDUCES FLOUNDER FEEDING AND GROWTH

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

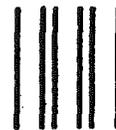
A number of the Northeast's inshore waters have chronically low levels of dissolved oxygen (hypoxia) during the summer months. Accordingly, we have begun to examine the effects of chronic hypoxia on the activity, feeding, and growth of young-of-the-year winter flounder. Initial results show that fish 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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MONTHLY HIGHLIGHTS



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OCTOBER 1987

IN THIS ISSUE:

DEMERSAL FINFISH STATUS DOCUMENTED

NORTHERN SHRIMP LESS ABUNDANT

HARD CLAM REPRODUCTIVE SUCCESS REFLECTS WATER QUALITY

SHELLFISH DISEASE DIAGNOSTIC METHODS EVALUATED

TAXONOMY REVISED FOR GAMBA PRAWNS (PSEUDARISTEUS)

PHYTOPLANKTON MONITORING IMPROVED

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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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.

RECENT PUBLICATIONS AND REPORTS

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- REID, R.N., M.C. INGHAM, and J.B. PEARCE, eds. 1987. NOAA's Northeast Monitoring Program (NEMP): A report on progress of the first five years (1979-84) and a plan for the future. NOAA Tech. Mem. NMFS-F/NEC-44. 138 p.
- RESEARCH PLANNING & COORDINATION STAFF, NORTHEAST FISHERIES CENTER. 1987. Northeast Fisheries Center Framework for inshore research. NOAA Tech. Mem. NMFS-F/NEC-49. 44 p.
- ROPES, J.W. 1987. Preparation of acetate peels of valves from the ocean quahog, Arctica islandica, for age determinations. NOAA Tech. Rep. NMFS 50. 5 p.
- SABO (GIBSON), B.D., and E.W. RHODES. 1987. Indexed bibliography of the bay scallop (Argopecten irradians). NOAA Tech. Mem. NMFS-F/NEC-48. 85 p.

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NORTHEAST FISHERIES CENTER

MONTHLY HIGHLIGHTS



United States Department of Commerce
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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. Browder

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

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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.

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 undetectable by fishermen and thus necessitate the special sampling 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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