

*J. Glisson*

# **NORTHEAST FISHERIES CENTER**

## **END-OF-YEAR REPORT**



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

CALENDAR YEAR 1987

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The Northeast Fisheries Center's End-of-Year Report is a synoptic administrative report on key Center research activities during the year. 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 write-up to contact for more information.

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August 1, 1988

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

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Data Management Support Staff Chief.....Dr. Eugene G. Heyerdahl  
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FACILITIES

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Contact: Frederick G. Kern

Milford Laboratory  
National Marine Fisheries Service, NOAA  
212 Rogers Avenue  
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(203) 783-4200 & FTS 642-5200  
Officer-in-Charge: Dr. Anthony Calabrese

**"FISHERMEN'S REPORTS" PRODUCED:** Distributed reports, written two weeks after completion of the spring and fall bottom trawl surveys and the summer sea scallop survey, on those surveys' sampling locations, catches, and environmental conditions. Contact Linda I. Despres-Patanjo, FTS 840-1346 or (508) 548-5123.

**ATLANTIC SALMON FISHERIES SAMPLED:** Sampled the commercial Atlantic salmon fisheries of Labrador, Newfoundland, and West Greenland to collect biological data and recover internal and external tags. Contact Dr. Kevin E. Friedland, FTS 840-1369 or (508) 548-5123.

**BIG GAME FISHERIES SURVEYED:** Obtained information on the recreational fishing effort and catch of tunas, billfishes, and sharks in Southern New England and Mid-Atlantic waters. Contact Darryl J. Christensen, FTS 840-1351 or (508) 548-5123.

**OCEAN QUAHOG AGE DETERMINATION TECHNIQUES PUBLISHED:** Described techniques for preparing acetate impressions of sectioned ocean quahog shells to reveal annular growth lines. Contact John Ropes, FTS 840-1287 or (508) 548-5123.

**NORTHERN SHRIMP RESOURCE ASSESSED:** Conducted cooperative survey and assessment work with state biologists to determine that the Gulf of Maine northern shrimp resource will be less abundant in the 1987-88 season than in the 1986-87 season. Contact Dr. Stephen H. Clark, FTS 840-1312 or (508) 548-5123.

**STOCK ASSESSMENT WORKSHOPS HELD:** Conducted and reported upon stock assessment workshops held during April and November to examine the status of several Northeast fish and invertebrate species. Contact Dr. Tim D. Smith, FTS 840-1251 or (508) 548-5123.

**STOCK ASSESSMENT REPORTS PRODUCED:** Completed several stock assessment reports and a summary report which reviews the status of 33 species, or groups of species, and which discusses the trends in the Northeast's marine commercial and recreational fisheries. Contact Dr. Tim D. Smith, FTS 840-1251 or (508) 548-5123.

**STATUS OF STOCKS MANAGED UNDER MULTISPECIES PLAN EVALUATED:** Reviewed and documented the status of the stocks of 11 species managed under the New England Fishery Management Council's Multispecies Fishery Management Plan, noting the high levels of fishing effort and mortality and the low level of resource abundance. Contact Dr. Tim D. Smith, FTS 840-1251 or (508) 548-5123.

**ECONOMIC PERFORMANCE OF COMMERCIAL FISHERIES REVIEWED:** Prepared a summary of the economic performance of the Northeast's major commercial fisheries, noting a slight improvement in gross revenue per vessel from 1985 to 1986 for most fisheries. Contact Dr. Philip N. Logan, FTS 840-1354 or (508) 548-5123.

**ECONOMICS OF ATLANTIC SALMON RESTORATION ESTIMATED:** Developed estimation procedures and actual estimates of the economic effects of Atlantic salmon restoration for use in discussions of "fair sharing" within the North Atlantic Salmon Conservation Organization. Contact Dr. Steven F. Edwards, FTS 840-1364 or (508) 548-5123.

**WINTER SKATE PROCESSING ASSISTED:** Determined meat yield and iced-storage life of winter skate. Contact Kurt Wilhelm, FTS 837-9308 or (508) 281-3600.

- SEAFOOD EDIBILITY CHARACTERIZED:** Established flavor and texture characteristics for 24 North Atlantic fish species as part of a national effort to profile the edibility of fish. Contact Barbara Jobe, FTS 837-9279 or (508) 281-3600.
- FISH WASTE-DERIVED FERTILIZER TESTED:** Converted Atlantic cod frames (what's left after filleting) into a liquid fertilizer which equaled or outperformed commercially available fertilizers on the experimental crops of cranberries and jalapeno peppers. Contact Vincent Ampola, FTS 837-9248 or (508) 281-3600.
- SEAFOOD NUTRITION INFORMATION DEVELOPED:** Published a literature review of seafood nutritional information (energy, polyunsaturated fatty acids, cholesterol, etc.) released during 1976-84, as well as analyzed the nutritional characteristics of 21 Northeast fish species. Contact Judith Krzynowek, FTS 837-9226 or (508) 281-3600.
- FISH OILS PURIFIED:** Isolated four omega-3 fatty acids--the kind purported to help prevent heart disease--in 95+ percent purities from fish oil concentrates on production-scale equipment. Contact Judith Krzynowek, FTS 837-9226 or (508) 281-3600.
- CHOLESTEROL CONTENT OF SQUID MEASURED:** Found so wide a range of cholesterol content in both shortfin and longfin squid (which we cannot link to size, location, or season) that we feel it would be difficult, if not impossible, to reliably include squid as an item in any low-cholesterol diet. Contact Judith Krzynowek, FTS 837-9226 or (508) 281-3600.
- FISH AND SEDIMENT CONTAMINANTS MEASURED:** Analyzed fish and sediments from 18 coastal/estuarine sites for trace organic contaminants (PCB 's, PAH's, DDT, etc.), generally finding the highest concentrations in sediments from Boston Harbor, Salem Harbor, and Raritan Bay. Contact Donald Gadbois, FTS 837-9286 or (508) 281-3600.
- SEAFOOD TOXICITY EXAMINED:** Responded to public concerns by testing Atlantic mackerel for neurotoxins, detecting them in mackerel livers, but not in mackerel muscle or in any samples from Atlantic herring, silver hake, goosefish, or northern shrimp. Contact Dr. Chris Martin, FTS 837-9297 or (508) 281-3600.
- MONOCLONAL ANTIBODIES DEVELOPED:** Developed a series of monoclonal antibodies which can help in diagnosing such diseases as infectious sarcoma disease in softshell clams, and such toxins as ciguatera toxin in certain tropical marine fish. Contact Ronald Lundstrom, FTS 837-9277 or (508) 281-3600.
- MARINE MAMMAL RESEARCH SUPPORTED:** Collaborated with contractors for research on: right whale population changes; harbor seal population estimates; humpback whale photo-identification; right, humpback, and fin whale habitat use in the Cape Cod Bay-Stellwagen Bank area; and marine mammal-fishery interactions in the Gulf of Maine gillnet fisheries. Contact Gordon T. Waring, FTS 840-1311 or (508) 548-5123.

**GEORGES BANK BOOK PUBLISHED:** Saw a seven-year multi-institution effort culminate in the publication of a treatise on Georges Bank, a book in which Center scientists authored several chapters on the capacity for fish production, the influence of ecological processes on fish populations, and the effects of fisheries exploitation. Contact Dr. Marvin D. Grosslein, FTS 840-1252 or (508) 548-5123.

**FISHERY FORECASTING MODELS USED:** Developed time-series models which can provide useful short-term forecasts for selected fisheries and which supplement standard stock assessment methods; initial uses being the prediction of catch levels in the Maine lobster fishery and of recruitment levels in the silver hake fishery. Contact Dr. Michael J. Fogarty, FTS 840-1255 or (508) 548-5123.

**ANTARCTIC FISHERIES RESOURCES REDUCED:** Conducted a survey of Antarctic fisheries resources as part of U.S. treaty-based activities in that region, finding a 90 percent drop in three heavily fished, cod-like fishes (Notothenia spp.) off South Georgia Island since 1982, and a 67 percent drop in krill. Contact Dr. Kenneth Sherman, FTS 838-6210 or (401) 782-3210.

**EMBRYONIC HEALTH ASSESSMENT METHODS DEVELOPED:** Described new procedures for assessing the health of fish embryos whether captured in the field or cultured in the lab. Contact Dr. Arlene Longwell, FTS 642-5207 or (203) 783-4207.

**JUVENILE GADID BEHAVIOR OBSERVED:** Used a research submersible to observe juvenile Atlantic cod and haddock on Georges Bank, finding their principal prey to be euphausiids and hyperiid amphipods, their principal predators to be sea ravens and sculpins. Contact Dr. Geoffrey C. Lawrence, FTS 838-6350 or (401) 782-3250.

**STRIPED BASS STOCKS DISTINGUISHED:** Developed a 75 percent accurate technique using a computerized image analyzer, which is more rapid and less expensive than biochemical techniques, to determine whether a striped bass belongs to the northern (Hudson) or southern (Chesapeake/Roanoke) stock of the species. Contact Jack Green, FTS 838-6240 or (401) 782-3240.

**ATLANTIC MACKEREL AND HERRING RECOVERY NOTED:** Documented the rapid recovery of Northwest Atlantic mackerel and the slow recovery of Georges Bank Atlantic herring following the overfishing of the 1960's and 1970's. Contact Dr. Kenneth Sherman, FTS 838-6210 or (401) 782-3210.

**ATLANTIC MACKEREL BIOMASS ESTIMATED:** Used egg surveys to estimate Northwest Atlantic mackerel biomass at 2.4 billion pounds, and to find that 89 percent of the spawning occurred in Canadian waters. Contact Wallace G. Smith, FTS 342-8260 or (201) 872-0200.

**ATLANTIC MACKEREL FECUNDITY DETERMINED:** Estimated the fecundity of Atlantic mackerel for both U.S.-caught and Canadian-caught fish. Contact Wallace G. Smith, FTS 342-8260 or (201) 872-0200.

**SHARK MIGRATION/MOVEMENT RECORDS SET:** Established, through tag returns, new shark migration/movement records, including time at liberty (sandbar-21.8 years, dusky-11.8, hammerhead-9.6, and blacktip-7.3), distance travelled (night-1400 miles, and scalloped hammerhead-765), and rate of travel (tiger-15.1 miles per day). Contact John G. Casey, FTS 838-6320 or (401) 782-3320.

- BABY BLUE SHARKS TAGGED:** Worked with Spanish and Portuguese scientists to tag 100 newborn blue sharks, as well as to collect biological samples of the baby blue sharks, at the principal nursery ground of this species in the Atlantic--the Iberian Peninsula. Contact John G. Casey, FTS 838-6320 or (401) 782-3320.
- GULF OF MAINE ZOOPLANKTON MONITORED:** Found that the spring 1986 concentration of the Gulf of Maine's dominant copepod, Calanus finmarchicus, was the highest in our 26-year program of transect monitoring the Gulf's zooplankton, temperature, and salinity. Contact Jack Green, FTS 838-6240 or (401) 782-3240.
- KRILL AGING TECHNIQUES ASSESSED:** Compared several different aging techniques for Antarctic krill, including length-frequency analysis, computerized image analysis, and fluorescent age pigment, and found that all suggest an eight-year life span. Contact Jack Green, FTS 838-6240 or (401) 782-3240.
- BAY SCALLOP BIBLIOGRAPHY PRODUCED:** Published a comprehensive bibliography, containing both author and subject indices, of 596 works on the bay scallop. Contact Edwin W. Rhodes, FTS 642-5226 or (203) 783-4226.
- HARD CLAM NUTRITION STUDIED:** Found, through controlled laboratory experiments, that an algae diet with a carbohydrate/protein ratio in the range of 0.3-0.4 supports the most rapid growth of young post-set hard clams. Contact Gary H. Wikfors, FTS 642-5225 or (203) 783-4225.
- HARD CLAM GROWTH FACTORS MEASURED:** Found, through field experiments, juvenile hard clam growth along the Connecticut shore of Long Island Sound to be influenced more by temperature and nutrition levels than by density of distribution. Contact James Widman, FTS 642-5208 or (203) 783-4208.
- SHELLFISH RECRUITMENT MEETING HELD:** Conducted the Center's 7th Shellfish Biology Seminar which dealt principally with the effects of biological, environmental, and geological factors on the larval setting and juvenile growth of mussels, oysters, and clams. Contact Dr. Walter Blogoslawski, FTS 642-5235 or (203) 783-4235.
- SHELLFISH DISEASE DIAGNOSES PROVIDED:** Performed disease diagnostic services on oysters, Asiatic clams, and blue mussels for various government, academic, and industrial clients. Contact Frederick G. Kern, (301) 226-5193.
- CHESAPEAKE BAY SOFTSHELL CLAM SARCOMA MONITORED:** Determined that the infectious sarcoma disease of Chesapeake Bay softshell clams was at generally low prevalences, but that it had invaded one new location--the Wye River. Contact C. Austin Farley, (301) 226-5193.
- OYSTER DISEASES MONITORED:** Prepared a report on the current impact of the oyster diseases "MSX", "SSO", and "Dermo" on the Atlantic and Gulf Coast fisheries. Contact Earl J. Lewis, (301) 226-5193.
- OYSTER DISEASE DIAGNOSIS IMPROVED:** Tested a new histocytologic technique for diagnosing the oyster pathogens "MSX" and "Dermo" which is rapid enough and accurate enough to provide an early warning to the oyster industry of impending oyster die-offs. Contact C. Austin Farley, (301) 226-5193.

**LARVAL WINTER FLOUNDER IMMUNITY EXAMINED:** Found that inherited resistance may be more important than pollution levels in the habitat of parent winter flounder in determining the susceptibility of their larval offspring to bacterial disease. Contact Dr. Richard A. Robohm, FTS 642-5237 or (203) 783-4237.

**PCB LEVELS IN WINTER FLOUNDER COMPILED:** Published data on the PCB levels in winter flounder ovaries and livers collected at five Long Island Sound sites during 1984-86. Contact Richard Greig, FTS 642-5231 or (203) 783-4231.

**BOSTON HARBOR WINTER FLOUNDER REPRODUCTION STUDIED:** Found poor egg quality and atypical embryonic development for winter flounder from Boston Harbor where many adult fish exhibit tumors. Contact Dr. Anthony Calabrese, FTS 642-5240 or (203) 783-4240.

**METABOLIC INDICATOR OF HABITAT CONDITION DEVELOPED:** Used the rate of change in winter flounder embryo metabolism as a biological indicator of habitat condition, finding abnormal metabolism of fertilized eggs of winter flounder from such urbanized and industrialized areas as western Long Island Sound and Boston Harbor. Contact Edith Gould, FTS 642-5222 or (203) 783-4222.

**WINTER FLOUNDER OVARIAN HISTOPATHOLOGY STUDIED:** Developed a method to study pollutant effects on winter flounder ovaries, particularly egg death and/or involution. Contact Dr. Joel E. Bodammer, (301) 226-5193.

**IMPAIRED SEA SCALLOP REPRODUCTION DISCOVERED:** Observed slowed, or even reversed, development of sea scallop gonads when the scallops were exposed in long-term lab experiments to copper concentrations typical of those found in some inshore scallop populations in the Gulf of Maine near municipal outfalls. Contact Edith Gould, FTS 642-5222 or (203) 783-4222.

**POLLUTION-ASSOCIATED LESIONS STUDIED:** Described a method for histochemically identifying heavy-metal accumulations in oysters that are associated with inflammatory lesions in the oysters. Contact C. Austin Farley, (301) 226-5193.

**CADMIUM-CONTAMINATED PHYTOPLANKTON ASSESSED:** Demonstrated, under controlled laboratory conditions, that diets of three algal species which had been cultured in the presence of cadmium--while not lethal to post-set hard clams--didn't support any clam growth. Contact Gary H. Wikfors, FTS 642-4225 or (203) 783-4225.

**HABITAT MONITORING REPORT RELEASED:** Published a report on findings of the Northeast Monitoring Program during 1979-84 which dealt specifically with water quality, sediment quality, bottom organisms, trace contaminants in organisms, and biological effects of contaminants. Contact Robert N. Reid, FTS 342-8220 or (201) 872-0200.

**DECLINE IN HEALTH OF NEW YORK BIGHT BENTHOS DETECTED:** Found substantial declines--with no causes yet evident--during 1979-86 in several health indicators (e.g., number of species) of the New York Bight's benthos. Contact Robert N. Reid, FTS 342-8220 or (201) 872-0200.

- HUDSON-RARITAN WATER QUALITY DESCRIBED:** Prepared information on dissolved oxygen, eutrophication, living resources, and contaminant effects for a report on water quality, and ways to improve water quality, in the Hudson-Raritan Estuary. Contact Anne L. Studholme, FTS 342-8200 or (201) 872-0200.
- RARITAN BAY FISHERIES DOCUMENTED:** Prepared an historical account of Raritan Bay's fisheries and how each fishery has been affected by pollution and other environmental factors. Contact Clyde MacKenzie, FTS 342-8267 or (201) 872-0200.
- 106-MILE DUMPSITE WATER MASSES MONITORED:** Released a report of the surface-water masses which were present at the 106-Mile Dumpsite and which received industrial chemical wastes or sewage sludge dumped there during October 1986 - September 1987. Contact Reed Armstrong, FTS 838-6280 or (401) 782-3280.
- 12-MILE DUMPSITE BASELINE ESTABLISHED:** Reported baseline information on water, sediments, bacteria, fish, and invertebrates at the 12-Mile Dumpsite prior to the cessation of sewage sludge dumping at the site in order to measure the extent and rate of recovery of the site's fisheries resources and habitats. Contact Dr. Robert A. Murchelano, FTS 840-1263 or (508) 548-5123.
- SEDIMENT CONTAMINANTS MEASURED:** Analyzed sediment samples, collected at 17 sites during the second year of monitoring (1985) for the National Status and Trends Program's Benthic Surveillance Survey, for major and trace metal levels, finding that Boston and Salem Harbors and lower New York Bay remain the most contaminated sites in the Northeast. Contact Vincent Zdanowicz, FTS 342-8232 or (201) 872-0200.
- HYPOXIC EFFECTS ON WINTER FLOUNDER STUDIED:** Found that chronically hypoxic (low dissolved oxygen) habitat causes young-of-the-year winter flounder to consume less food and grow more slowly, thus increasing their vulnerability to predation. Contact Alan Bejda, FTS 342-8280 or (201) 872-0200.
- RED TIDE REPORT PREPARED:** Completed a report on a cooperative survey of the distribution of the red tide-causing dinoflagellate, Gonyaulax tamarensis, in coastal New Jersey waters. Contact Dr. John Mahoney, FTS 342-8255 or (201) 872-0200.
- SURFACE CHLOROPHYLL AND WATER-COLUMN PRODUCTION LINKED:** Found a well-defined seasonal pattern in the ratio of surface-water chlorophyll levels and water-column primary production levels, suggesting that color-sensitive satellites could be used to estimate water-column primary production. Contact Jay E. O'Reilly, FTS 342-8205 or (201) 872-0200.
- WARM-CORE RING POSITIONS MONITORED:** Documented the locations and movements of warm-core Gulf Stream rings (pinched off meanders) and the shelf water - slope water front off the northeastern United States during 1987. Contact Reed Armstrong, FTS 838-6280 or (401) 782-3280.
- HARD CLAM PREDATORS SURVEYED:** Established that heavy predation--primarily by crustaceans--reduced the juvenile populations of hard clams in Great South Bay, New York, and Barnegat Bay, New Jersey, by more than 50 percent. Contact Clyde MacKenzie, FTS 342-8257 or (201) 872-0200.

**SAND LANCE SPECIES REVISED:** Presented a paper which taxonomically revises the sand lance to include not one but two species in the Northwest Atlantic, an inshore species (Ammodytes americanus De Kay 1842) which occurs in protected bays and estuaries from Labrador to Delaware and Chesapeake Bay, and an offshore species (A. dubius Reinhardt 1838) which occurs in unprotected coastal waters from Greenland to North Carolina. Contact Dr. Bruce B. Collette, FTS 357-2524 or (202) 357-2524.

**NEW SPECIES OF INDO-PACIFIC CLUPEOIDS DESCRIBED:** Published papers on research with Indo-Pacific clupeoids--a group which includes herrings, sardines, and anchovies and is important as food and tuna bait--that describe four new species from Australia and two new species of Pacific anchovies. Contact Dr. Bruce B. Collette, FTS 357-2524 or (202) 357-2524.

**ILLUSTRATED LOBSTER KEY ISSUED:** Published an illustrated key with a number of full-color photographs for identifying all lobster species in U.S. trade, as well as those lobster species with minor or potential commercial value. Contact Dr. Austin B. Williams, FTS 357-2639.

**ILLUSTRATED PENAEOID SHRIMP KEY PREPARED:** Completed an illustrated key--based on readily recognizable characters--to the 37 species of penaeoid shrimp in American waters, including information on common names, maximum length for each sex, and geographic and bathymetric ranges. Contact Dr. Austin B. Williams, FTS 357-2639 or (202) 357-2639.

**GAMBA PRAWN GENUS PSEUDARISTEUS REVISED:** Published a monograph which revises the wide-ranging gamba prawn genus Pseudaristeus to include six species, two previously unknown to science, one previously known only in the juvenile stage, and five with commercial value. Contact Dr. Austin B. Williams, FTS 357-2639 or (202) 357-2639.

**Information Services Section  
Northeast Fisheries Center  
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