

*J. Gibson*

# **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 1990**

---

The Northeast Fisheries Center's *End-of-Year Report* is a news summary of selected Center research activities during the year. It focuses on those research findings which have practical application either to fisheries resource and habitat management, or to commercial and recreational fisheries interests.

Many of the findings are covered in detail in publications and reports prepared by Center scientists. For those items in this summary which are preceded by an asterisk (\*), a publication or report is available upon written request to: Information Services Section, Northeast Fisheries Center, 166 Water St., Woods Hole, MA 02543 USA. For those items which are not preceded by an asterisk, the availability of publications or reports must be ascertained by contacting the scientist listed at the end of the given item. Both federal and commercial telephone numbers are listed for each contact.

Common names of organisms mentioned in this summary follow those given in the lists of common names of fishes, mollusks, and decapod crustaceans published by the American Fisheries Society. Trade names mentioned in this summary do not imply endorsement by any individual or unit of the federal government.

---

July 1, 1991

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

ADMINISTRATION

Science & Research Director (Acting).....	Dr. John B. Pearce
Deputy Center Director.....	Dr. John B. Pearce
Conservation & Utilization Division Chief.....	Dr. Vaughn C. Anthony
Fisheries Ecology Division Chief (Acting).....	Dr. Robert A. Murchelano
Environmental Processes Division Chief.....	Dr. Robert A. Murchelano
National Systematics Laboratory Director.....	Dr. Bruce B. Collette
Research Planning & Coordination Staff Chief (Acting).....	Dr. Ambrose Jearld, Jr.
Data Management Support Staff Chief.....	Dr. Eugene G. Heyerdahl
Program Support Staff Chief.....	Mary G. Laird

FACILITIES

**Woods Hole Laboratory**  
 National Marine Fisheries Service, NOAA  
 166 Water Street  
 Woods Hole, MA 02543  
 (508) 548-5123 & FTS 840-1011  
 Officer-in-Charge: Dr. Marvin Grosslein

**Narragansett Laboratory**  
 National Marine Fisheries Service, NOAA  
 28 Tarzwell Drive  
 Narragansett, RI 02882  
 (401) 782-3200 & FTS 838-6200  
 Officer-in-Charge: Dr. Kenneth Sherman

**Gloucester Laboratory**  
 National Marine Fisheries Service, NOAA  
 30 Emerson Avenue  
 Gloucester, MA 01930  
 (508) 281-9300 & FTS 837-9276  
 Officer-in-Charge: Robert J. Learson

**Sandy Hook Laboratory**  
 National Marine Fisheries Service, NOAA  
 Building 74, McGruder Road  
 Highlands, NJ 07732  
 (908) 872-3000 & FTS 342-3000  
 Officer-in-Charge: Anne L. Studholme

**Milford Laboratory**  
 National Marine Fisheries Service, NOAA  
 212 Rogers Avenue  
 Milford, CT 06460  
 (203) 783-4200 & FTS 642-5200  
 Officer-in-Charge: Dr. Anthony Calabrese

**Oxford Laboratory**  
 National Marine Fisheries Service, NOAA  
 904 South Morris Street  
 Oxford, MD 21654  
 (301) 226-5193  
 Contact: Frederick G. Kern

**National Systematics Laboratory**  
 National Marine Fisheries Service, NOAA  
 National Museum of Natural History  
 10th & Constitution Avenue, N.W.  
 Washington, DC 20560  
 (202) 357-2552 & FTS 357-2552  
 Director: Dr. Bruce B. Collette

**INFORMATION SERVICES SECTION: Teri L. Prady, Chief**

- Scientific Publishing & Technical Editing: Jon A. Gibson, Teri L. Prady
- Scientific Libraries & Technical Information: Susie K. Hines, Claire L. Steimle, Judith D. Berrien, Lynn D. Forbes
- Graphic Arts & Audiovisual Services: Brenda F. Figuerido
- Public Information: Teri L. Prady, Jon A. Gibson

**NORTHEAST FISHERIES CENTER  
CALENDAR YEAR 1990  
END-OF-YEAR REPORT**

- \*1. **ANNUAL STATUS-OF-THE-STOCKS REPORT ISSUED:** The annual "Status of the Fishery Resources off the Northeastern United States" was issued. In addition to detailing the population status of 33 species or species groupings, the report also discusses trends in: commercial and recreational fishery landings; commercial fishery economics; and four broad categories of fishery resources -- principal groundfish and flounders, principal pelagics, skates & spiny dogfish, and other finfish (Dr. Steven A. Murawski, FTS 840-1303 or (508) 548-5123).
2. **STOCK ASSESSMENT WORKSHOPS HELD:** The Center hosted two stock assessment workshops (SAWs) in Woods Hole, each involving 86 participants from marine fishery management and research agencies and institutions:
- \*a. The 10th SAW, held June 4-8, involved: reviewing assessments of ocean quahog, northern shortfin squid, longfin squid, Atlantic mackerel, butterfish, and two silver hake stocks; reviewing current issues and future directions for assessments of pollock and offshore American lobster stocks; discussing working group reports on stock assessment methods, sea scallop analyses, sea sampling priorities, and SAW documentation; and discussing special presentations on Atlantic herring stock recovery and the experimental silver hake fishery (Dr. Wendy L. Gabriel, FTS 840-1213).
- \*b. The 11th SAW, held as a Stock Assessment Review Committee meeting during October 15-19 and a plenary meeting during November 5-7, involved: reviewing new assessments of Georges Bank Atlantic cod, Atlantic herring, and summer flounder; reviewing updated assessments of nine additional species; discussing assessment and research programs for northern shortfin squid, longfin squid, Atlantic salmon, tilefish, and marine mammals; and discussing progress in sea sampling programs and modeling of stock rebuilding strategies (Dr. Andrew A. Rosenberg, FTS 840-1225 or (508) 548-5123).

3. **MULTISPECIES ASSESSMENTS EVALUATED FOR MANAGING NORTH ATLANTIC ECOSYSTEMS:** The Center chaired the International Council for the Exploration of the Sea's working group meeting on multispecies stock assessments in Woods Hole during December 4-13. Participants evaluated predator-prey interactions and mixed-species fishing fleet effects on fishery management policies for the North, Baltic, and Barents Seas, and for waters off Iceland, Newfoundland's Grand Banks, and the northeastern United States (Dr. Steven A. Murawski, FTS 840-1303 or (508) 548-5123).
4. **EMERGENCY STRIPED BASS STUDY ANNUAL REPORT PUBLISHED:** The Center published the 1990 annual report of the Congressionally mandated study on the reasons for declines in Atlantic striped bass populations, and on the current status of those populations. The report covers recruitment indices, fishing mortality rates, environmental factors in early-life-stage survival, and alternative management measures (Dr. R. Anne Richards, FTS 840-1357 or (508) 548-5123).
5. **EMERGENCY STRIPED BASS STUDY ANNUAL WORKSHOP CONDUCTED:** The Center co-chaired the 1990 annual workshop of the Emergency Striped Bass Study at which federal, state, and academic scientists evaluated research projects on factors affecting striped bass population dynamics (Dr. R. Anne Richards, FTS 840-1357 or (508) 548-5123).
6. **ATLANTIC MACKEREL CAN WITHSTAND LARGE CATCHES SHORT TERM:** A modeling study of Northwest Atlantic mackerel shows -- in the current context of large increases in population density being accompanied by decreases in growth and maturation rates -- that large catches (more than 800 million pounds) in the short term would not significantly lower the spawning stock biomass (Dr. William J. Overholtz, FTS 840-1256 or (508) 548-5123).
7. **FATE OF MID-ATLANTIC'S EASTERN OYSTER FISHERY DEBATED:** An open forum on the decline of the Mid-Atlantic's eastern oyster fishery was held. Fishery scientists, officials, and industry representatives discussed whether the decline was irreversible, or even stoppable (Dr. Aaron Rosenfield, (301) 226-5193).
8. **FISH AND INVERTEBRATE RESOURCE SURVEYS CONDUCTED:** We conducted spring and autumn bottom trawl surveys from Cape Fear, North Carolina, to the Gulf of Maine (667 sampling sites in all) and a summer sea scallop survey from the Mid-Atlantic to Georges Bank (469 sampling sites). Another 94 sites on Georges Bank were sampled with bottom trawls during gear comparison trials (Thomas R. Azarovitz, FTS 840-1283 or (508) 548-5123).

- \*9. **RESOURCE SURVEY REPORTS DISTRIBUTED:** *Fishermen's Reports* listing the sampling locations, catches of selected species, and bottom temperatures during our resource surveys were distributed to fishermen and other interested parties immediately following our spring and autumn bottom trawl surveys and summer sea scallop survey (Linda I. Despres-Patanjo, FTS 840-1346 or (508) 548-5123).
10. **RESOURCE SURVEY DATA MICROFILMED:** To increase security and accessibility to our resource survey data base -- the longest running and most comprehensive living marine resource data base in the world -- we have microfilmed data logs for bottom trawl surveys during 1963-90, Atlantic surfclam and ocean quahog surveys during 1970-89, and sea scallop surveys during 1956-90 (Linda I. Despres-Patanjo, FTS 840-1346 or (508) 548-5123).
- \*11. **ATLAS PREPARED OF SEASONAL DISTRIBUTIONS OF COMMERCIAL LANDINGS:** An atlas has been prepared of the seasonal distribution patterns of commercial landings of 45 fish and invertebrate species off the northeastern United States during 1977-88. Landings are prorated to 10-minute squares of latitude and longitude (Dr. Sukwoo Chang, FTS 342-3067 or (908) 872-3067).
12. **HIGH-SEAS HARVESTS OF U.S. ATLANTIC SALMON CALCULATED:** Based on returns of external Carlin tags from harvested U.S.-origin Atlantic salmon, the estimated harvest rate of our fish in 1989 off Canada averaged 42 percent, and off Greenland averaged 61 percent (Dr. Kevin D. Friedland, FTS 840-1369 or (508) 548-5123).
13. **SEA SAMPLING OF NORTHEAST'S COMMERCIAL FISHERIES CONDUCTED:** Through a contract with Manomet Bird Observatory, we covered 793 sea days aboard commercial fishing vessels -- including otter trawlers, groundfish sink gillnetters, and swordfish drift gillnetters -- from Maine to Virginia. Data were collected on fishery practices, catches, economics, and interactions with marine mammals (Gregory R. Power, FTS 840-1266 or (508) 548-5123).
14. **OBSERVERS COVER ALL EAST COAST FOREIGN FISHING:** NMFS foreign fishery observers covered all East Coast foreign fishing which involved German, Polish, and Soviet vessels either catching Atlantic mackerel or engaging in at-sea transfers of U.S.-caught mackerel and northern shortfin squid (Patricia Gerrior, FTS 840-1291 or (508) 548-5123).

15. **EFFORT AND CATCH OF BIG-GAME FISHERIES MONITORED:** Recreational effort and catch data, as well as biological data, were obtained and processed for tunas, billfishes, and sharks in Southern New England and Mid-Atlantic waters. Approximately 6,000 dockside and telephone interviews have been conducted yearly since 1986 (Harold A. Foster, FTS 1212 or (508) 548-5123).
- \*16. **BETTER APPROACH TO ECONOMIC VALUATION OF FISHERY RESOURCES DEVELOPED:** A better approach to economically evaluating fishery resources has been reported in: "An Economics Guide to Allocation of Fish Stocks between Commercial and Recreational Fisheries." The report corrects common misconceptions regarding fishery valuations and economic impact analyses (Dr. Steven F. Edwards, FTS 840-1364 or (508) 548-5123).
17. **NEW BOOK FOCUSES ON SHARK RESOURCES:** Proceedings of the second U.S.-Japan workshop on the status of elasmobranchs (i.e., sharks, skate, and rays), "Elasmobranchs as Living Resources: Advances in Biology, Ecology, Systematics, and Status of the Fisheries," have been published (Harold L. Pratt, Jr., FTS 838-6323 or (401) 782-3323).
- \*18. **GUIDE SHOWS HOW TO BOOST ESTUARINE BIVALVE PRODUCTION:** A guide has been prepared to show estuarine managers of public shellfish beds and commercial mariculturists with leased beds how to boost bivalve mollusk production. The guide includes a recommendation for the use of "shellfish production specialists" to assist in determining bed condition, spatfall amount, predation losses, and methods to increase yields (Clyde L. MacKenzie, Jr., FTS 342-3019 or (908) 872-3019).
- \*19. **SHELLFISH BIOLOGY SEMINAR HELD; ABSTRACTS AVAILABLE:** We sponsored a shellfish biology seminar covering harmful effects of toxic plankton blooms, new methods to improve growth of cultured shellfish, possible use of marinas for shellfish mariculture, and genetic selection techniques to confer disease resistance in eastern oysters. Copies of abstracts are available (Dr. Walter J. Blogoslawski, FTS 642-5235 or (203) 783-4235).
20. **BAY SCALLOPS STOCKED AT EXTIRPATED SITES:** Of the bay scallops we spawned in May and raised through September for our research needs, an excess 2,000 were given to the state of Connecticut for stocking areas where the species has been extirpated (Edith Gould, FTS 642-5222 or (203) 783-4222).

21. **PARALYTIC TOXICITY IN ATLANTIC SURFCLAMS REDUCED BY HEATING:** The paralytic toxicity sometimes found in the edible portion of Atlantic surfclams from Georges Bank was reduced by heat treatment, suggesting that surfclams too toxic for human consumption when fresh might be rendered acceptable through canning (Kurt A. Wilhelm, FTS 837-9308 or (508) 281-9308).
22. **PARALYTIC TOXINS STILL OCCURRING IN ATLANTIC MACKEREL LIVERS:** For the third year in a row, Atlantic mackerel livers -- but no edible portions (muscle and roe) -- continue to contain paralytic toxins. Some seasonal and geographical differences in toxin composition have been determined (Dr. Christopher Martin, FTS 837-9297 or (508) 281-9297).
- \*23. **LEAFLET LISTS SEAFOOD NUTRITIONAL CONTENTS:** The Center has issued an information leaflet which lists cholesterol, fat, and Omega-3 (polyunsaturated fatty acids which fight heart disease) content in cooked, four-ounce portions of 27 Northeast seafood species/products (Judith Krzynowek, FTS 837-9226 or (508) 281-9226).
- \*24. **FISH-OIL SEPARATION METHODS REPORTED:** Information on separating fish oil into its components, particularly its fatty acids, was published (Judith Krzynowek, FTS 837-9226 or (508) 281-9226).
25. **STEROL CONTENT OF ARCTIC SURFCLAM DOCUMENTED:** The sterol content of the Arctic surfclam was determined; one sterol, B-sitosterol, which is of interest to the pharmaceutical industry, is noticeably absent (Judith Krzynowek, FTS 837-9226 or (508) 281-9226).
26. **PHYTOPLANKTON SOURCE FOUND FOR EASTERN OYSTER STEROLS:** Although eastern oysters cannot produce their own sterols, they contain many sterols, some of which have never been found in their natural phytoplankton food. This puzzle has been solved by collaborative research with the University of Maryland in which pure phytoplankton cultures yielded small amounts of sterols found in oysters, but not previously found in algae (Gary H. Wikfors, FTS 642-5225 or (203) 783-4225).
27. **CHOLESTEROL TEST USED AS AMBERGRIS TEST:** The Center has successfully used a test designed to detect and measure cholesterol as a test for ambergris -- a sperm whale by-product historically used in perfume manufacture and currently illegal to possess (Judith Krzynowek, FTS 837-9226 or (508) 281-9226).

28. **MONOCLONAL ANTIBODIES DETECT SALMON FLESH:** A species-specific monoclonal antibody which detects heat-stable protein antigens from pink salmon was developed. It can, for example, detect the presence or absence of pink salmon flesh in canned fishery products. Other antibodies were developed which detect various combinations of other salmonid species (Ronald C. Lundstrom, FTS 837-9277 or (508) 281-9277).
29. **IMMUNOASSAY DETECTS SURIMI IN FRANKFURTERS:** A monoclonal-antibody-based immunoassay which determines the amount of minced fish flesh, or surimi, in combination meat-fish frankfurters was developed (Ronald C. Lundstrom, FTS 837-9277 or (508) 281-9277).
30. **ROBOTICS SYSTEM AIDS MONOCLONAL ANTIBODY DEVELOPMENT:** An automated laboratory system, using a computer-aided robotic arm and specialized workstations to perform immunoassays as part of our monoclonal antibody development project, has increased our testing rate more than threefold (Ronald C. Lundstrom, FTS 837-9277 or (508) 281-9277).
31. **FORENSIC CHEMISTRY AIDS U.S. TRADE IN SEAFOOD PRODUCTS:** Our tests of Brazilian lobster tails, which had been exported to Canada by a U.S. firm and subsequently impounded by the Canadian Inspection Service because of suspected coloration with paprika, showed that paprika was not present, and that the coloration was due to natural carotene pigmentation. The tails were released for sale. (Judith Krzynowek, FTS 837-9226 or (508) 281-9226).
32. **ANGLERS' GUIDE TO FISH AS FOOD PUBLISHED:** Center scientists authored a book, *Making the Most of Your Catch*, which applies findings from our seafood handling, processing, preservation, and storage research specifically to the needs of recreational fishermen (Judith Krzynowek, FTS 837-9226 or (508) 281-9226).
33. **PROCEEDINGS OF LARGE-MARINE-ECOSYSTEMS SYMPOSIUM PUBLISHED:** "Large Marine Ecosystems: Patterns, Processes, and Yields" has been published, focusing on the effects of perturbations on biomass yields in five large marine ecosystems (LMEs) over several decades, the effects of biodynamic processes on survival, genetics, and recruitment of marine populations, the theory underlying patterns and processes in LMEs as well as dynamics affecting biomass yields in LMEs, and the inter-relationships of science, geography, and law in management of LMEs (Dr. Kenneth Sherman, FTS 838-6210 or (401) 782-3210).

34. **CARTILAGINOUS AND PELAGIC FISHES DOMINATE FINFISH COMMUNITY:** Decreases in groundfish (e.g., haddock) biomass in the Northeast Continental Shelf Ecosystem continue to be accompanied by increases in cartilaginous fish (e.g., spiny dogfish) and small pelagic fish (e.g., Atlantic mackerel) biomass. Rebuilding of depleted groundfish stocks will likely require the identification of, understanding of, and accounting for the role of these cartilaginous and pelagic fishes within the finfish community (Dr. Kenneth Sherman, FTS 838-6210 or (401) 782-3210).
35. **ATLANTIC MACKEREL AND ATLANTIC HERRING CONTROL SAND LANCE:** Evidence so far supports the hypothesis that sand lance abundance in the Northeast Continental Shelf Ecosystem is controlled by Atlantic mackerel and Atlantic herring predation. Further analysis will look at the relative effect of each predator and at any regional differences in the predatory relationship (Dr. Michael J. Fogarty, FTS 840-1255 or (508) 548-5123).
- \*36. **SAND DOLLAR PRODUCTION ESTIMATED:** Secondary production and population dynamics have been determined for the northern sand dollar, *Echinarachnius parma*, a dominant species of sandy continental shelf habitats and a potential "sink" for energy flow through fisheries ecosystems (Frank W. Steimle, Jr., FTS 342-3059 or (908) 872-3059).
- \*37. **NORTHWEST/NORTHEAST ATLANTIC ZOOPLANKTON SHOW DIFFERENT TRENDS:** A comparison of zooplankton abundance in the Northwest and Northeast Atlantic over the past three decades shows a decrease in the Northeast Atlantic, but no observable trend in the Northwest Atlantic except for an apparent increase in the copepod *Calanus finmarchicus*. The differing abundance trends may reflect differing climatic trends (Dr. Kenneth Sherman, FTS 838-6210 or (401) 782-3210).
38. **GULF-OF-MAINE COPEPODS HIT 11-YEAR HIGH:** Copepod abundance in the Gulf of Maine was the highest in the last 11 years. Coincidentally, the surface salinities were also the highest in the last 11 years, and, for the fifth year in a row, the surface temperatures were colder than normal in the winter and warmer than normal in the summer (Jack W. Jossi, FTS 838-6274 or (401) 782-3274).
39. **GULF-OF-MAINE PLANKTON MONITORING MAY GAUGE GLOBAL WARMING:** We have completed the 30th consecutive year of measuring monthly species composition and relative abundance of phytoplankton and zooplankton across the Gulf of Maine. This time series, the longest for any area in the western Atlantic, has now become an important biological reference for global warming research (Jack W. Jossi, FTS 838-6274 or (401) 782-3274).

40. **STEROL CONTENT AFFIRMS DIATOM TAXONOMY:** Collaborative research with the University of Maryland shows a difference in the isomeric structure of sterol compounds found in the two recognized subclasses of diatom algae -- pennates and centrics. This finding suggests that sterol structure may be a tool to establish taxonomic relationships among diatoms, and, that by studying the isomeric structure of sterol compounds in the tissues of phytoplankton-grazing animals, the food habits of those animals may be better understood (Gary H. Wikfors, FTS 642-5225 or (203) 783-4225).
- \*41. **ZOOPLANKTON IMAGE ANALYZER IMPROVED:** An image analyzer, developed by the Center and used to count, measure, and identify zooplankton in seawater samples, has been modified so that it can now perform 40 different kinds of measurements within seconds on each zooplankter (Mark S. Berman, FTS 838-6243 or (401) 782-3243).
42. **MARINE MAMMAL RESEARCH EXPANDED/FORMALIZED:** A Marine Mammals Investigation has been created to meet increasing needs for information on the optimum sustainable population sizes of marine mammals, the numbers of marine mammals accidentally killed during fishing operations, and the ecological relationships between marine mammals and fishery resources in the Northwest Atlantic (Dr. Tim D. Smith, FTS 840-1251 or (508) 548-5123).
43. **LINK BETWEEN WHALE DISTRIBUTION AND GULF STREAM LOCATION CONFIRMED:** Distributions of whales and dolphins were highly correlated with the location of the northern wall of the Gulf Stream during an August survey (Dr. Tim D. Smith, FTS 840-1251).
44. **NORTHEAST'S HARBOR PORPOISES MAY COMPRISE SINGLE POPULATION:** During August, the distribution of harbor porpoise was found to be continuous from the Gulf of Maine and Bay of Fundy around Nova Scotia east to Halifax, suggesting that the animals may comprise a single population (Dr. Tim D. Smith, FTS 840-1251).
45. **NEW SPECIES OF CUSK EEL DISCOVERED:** We discovered a new species of cusk eel in the Middle Atlantic Bight from our larval survey collections, and corroborated the existence of the new species by subsequently finding 14 previously misidentified adults of the new species in archive collections. A description of the new species will soon be published (Michael P. Fahay, FTS 342-3061 or (908) 872-3061).

- \*46. **TWO SPECIES OF NORTHWEST ATLANTIC SAND LANCE DISTINGUISHED:** Two sand lance species have been distinguished in the Northwest Atlantic: *Ammodytes americanus* DeKay occurs in shallow coastal waters and estuaries from Delaware to Labrador; *A. dubius* Reinhardt occurs mostly in offshore waters, but sometimes in inshore waters with *A. americanus*, from North Carolina to Labrador (Dr. Bruce B. Collette, FTS 357-2524 or (202) 357-2524).
- \*47. **SEVEN NEW SPECIES OF TONGUEFISHES DESCRIBED:** Study of flatfishes collected during recent surveys has resulted in the description of two eastern Atlantic and five eastern Pacific tonguefishes of the genus *Symphurus* new to science (Dr. Thomas A. Munroe, FTS 357-2550 or (202) 357-2550).
- \*48. **NEW FISH SPECIES DISCOVERED OFF MADAGASCAR:** Study of fishes collected on Walters Shoals south of Madagascar during a cooperative cruise on the Soviet oceanographic vessel *Vityaz* in 1988 has resulted in the discovery of several new fish species. First to be described is a scorpionfish (*Scorpaenodes*); others include a moray eel and a midwater snapper (Dr. Bruce B. Collette, FTS 357-2524 or (202) 357-2524).
- \*49. **NEW SPECIES OF MUD CRAB DESCRIBED:** A new species of mud crab, *Panopeus margentus*, from northeastern Argentina was described and compared with its apparent closest relative in Pacific Panama near the Canal Zone (Dr. Austin B. Williams, FTS 357-2550 or (202) 357-2550).
- \*50. **NEW GENUS OF MUD SHRIMP ESTABLISHED:** A commensal shrimp that bores holes in hard corals of the tropical western hemisphere has been placed into a new genus (*Pomatogebia*). This shrimp and its relatives degrade stony coral skeletons (Dr. Austin B. Williams, FTS 357-2550 or (202) 357-2550).
- \*51. **NEW SPECIES OF SQUAT LOBSTERS DESCRIBED:** Three species of squat lobsters (*Munidopsis*) occurring in hydrothermal vent and other deepsea habitats in the Pacific Ocean have been described (Dr. Austin B. Williams, FTS 357-2550 or (202) 357-2550).
52. **METHOD DISTINGUISHES BETWEEN WILD AND PEN-REARED ATLANTIC SALMON:** By using the knowledge that Atlantic salmon scales have unique mathematical formulas describing their shapes, and by applying a computer-aided, image-analysis system to the analysis of salmon scales, Center scientists can now determine if a harvested salmon was pen-reared or of wild origin (Dr. Kevin D. Friedland, FTS 840-1369 or (508) 548-5123).

- \*53. **DENSITY DISTRIBUTIONS OF JUVENILE GROUND FISH MAPPED:** To evaluate closed areas and other fishery management measures to minimize catch and discard of juvenile groundfish being managed under the Northeast Multispecies Fishery Management Plan, the Center has determined, based on bottom trawl survey data, the density distributions of juveniles of 10 important groundfish stocks and portrayed them in map form (Susan E. Wigley, FTS 840-1359 or (508)548-5123).
- \*54. **WINTER FLOUNDER SHOW CONSIDERABLE COASTAL MOVEMENT:** A three-year tagging study of winter flounder in the Hudson-Raritan Estuary and inner New York Bight shows that in addition to localized seasonal migrations, there is intermixing of individuals from New Jersey, New York, and points further north (Beth Phelan, FTS 342-3079 or (908) 872-3079).
- \*55. **SHARK TAGGING NEWSLETTER PUBLISHED:** The Center again sent to cooperators in the NMFS Cooperative Shark Tagging Program an annual newsletter, *The Shark Tagger*, highlighting distance and time records for sharks tagged and recaptured, results of field studies, results of student research, and progress on a shark fishery management plan for the Atlantic (John G. Casey, FTS 838-6320 or (401) 782-3320).
56. **POPULATION SIZE AND MATURATION RATE VARY INVERSELY IN SOME FLATFISH:** For some species of flatfish in the Gulf of Maine, maturation occurs earlier in a fish's life as population size declines (John M. Burnett, FTS 840-1286 or (508) 548-5123).
- \*57. **INSHORE ACADIAN REDFISH MATURE QUICKER, SMALLER THAN OFFSHORE COUNTERPARTS:** Acadian redfish inhabiting the shallower inshore areas of the Gulf of Maine - Georges Bank region mature at a younger age and smaller size than their counterparts inhabiting the deeper and/or offshore areas. Maturity of female fish regionwide and of male fish offshore depends upon both age and size, but maturity of male fish inshore depends almost totally upon age alone (Ralph K. Mayo, FTS 840-1310 or (508) 548-5123).
- \*58. **MORE ATLANTIC MACKEREL SPAWN NORTH OF BORDER:** A joint U.S.-Canadian study of Atlantic mackerel spawning biomass and egg production in the Gulf of St. Lawrence and northeastern U.S. waters found spawning biomass to be 10 times higher, and spawning to be later, in Canadian waters (Peter L. Berrien, FTS 342-3066 or (908) 872-3066).

59. **SPAWNING ATLANTIC HERRING PREFER PEBBLE-SIZED GRAVEL:** Historic spawning beds of Atlantic herring on northern Georges Bank have been surveyed with a submersible vessel; subsequent analysis of sediment samples shows that herring prefer pebble-sized gravel on which to spawn (Dr. R. Gregory Lough, FTS 840-1290 or (508) 548-5123).
- \*60. **ATLANTIC HERRING ON GEORGES BANK CONTINUE RECOVERY:** Concentrations of recently hatched Atlantic herring larvae occurred on Georges Bank as far eastward as Cultivator and Georges Shoals, indicating that the species is continuing its recolonization of Georges Bank following its apparent extirpation there during 1978-82, and that the population biomass in the Nantucket Shoals/Massachusetts Bay/Georges Bank area is continuing to increase (Wallace G. Smith, FTS 342-3060 or (908) 872-3060).
- \*61. **COLDER WATER YIELDS LARGER WINTER FLOUNDER LARVAE:** At first feeding, winter flounder larvae are larger (*i.e.*, longer) and in better condition (*i.e.*, higher protein and RNA content) when incubated at 2°C rather than 7°C (Dr. Lawrence J. Buckley, FTS 838-6368 or (401) 782-3368).
62. **LARGER WINTER FLOUNDER LARVAE SURVIVE BETTER:** Larger yolk-sac larvae of winter flounder from Long Island Sound and Narragansett Bay survive better than smaller yolk-sac larvae during the first month of life (Dr. Lawrence J. Buckley, FTS 838-6368 or (401) 782-3368).
- \*63. **LARVAL FISH ABUNDANCE TIED TO PLANKTON DENSITY:** An analysis of our multiyear, ecosystemwide survey data shows larval fish abundance to be correlated with zooplankton density year-round, as well as with chlorophyll levels (*i.e.*, phytoplankton) during cold months (Carol J. Meise-Munns, FTS 838-6278 or (401) 782-3278).
- \*64. **LARVAL FISH CATCHABILITY VARIES BY SPECIES, TIME OF DAY:** An analysis of our larval fish surveys shows night catches exceeding day catches by 62 percent, and several species exhibiting net avoidance. This information will be factored into our estimates of within-year and year-to-year variation in larval fish abundance and mortality (Wallace W. Morse, FTS 342-3040 or (908) 872-3040).
65. **LARVAL FISH HEALTH ASSESSMENT METHOD IMPROVED:** A method of assessing recent growth and condition of fish larvae, based on RNA/DNA content, has been automated. We can now process more samples, and we can determine the RNA/DNA content of individual larvae where before we had to determine it for a pooled sample of 20 or more fish (Elaine M. Calderone, FTS 838-6353 or (401) 782-3353).

- \*66. **MEANS TO ASSESS YOUNG SQUID NUTRITIONAL HEALTH EXAMINED:** Since starvation is a likely cause of the significant mortality of young squid as they run out of yolk-sac nutrition, we have studied and now reported on some histological characteristics of digestive gland cells of paralarval squid which reveal their nutritional condition (Dr. Michael Vecchione, FTS 357-4990 or (202) 357-4990).
67. **TIME-AT-LIBERTY RECORD SET BY SANDBAR SHARK:** A female sandbar shark, tagged by federal fishery scientists in 1965 and recaptured by a commercial longline fisherman in 1990, set a new record (i.e., 25.0 years) for time at liberty for any shark tagged in the Atlantic. The shark had an average growth rate of 2.5 cm per year, confirming this species' very slow growth rate (John G. Casey, FTS 838-6320 or (401) 782-3320).
68. **INITIAL INFORMATION ON SHARK WEIGHTS DEVELOPED:** The first comprehensive information on total, dressed, and fin weights of various shark species was developed, then combined with existing information on distribution, migrations, abundance, and food consumption rates for use in preparing a shark fishery management plan (John G. Casey, FTS 838-6320 or (401) 782-3320).
69. **LENGTH-BASED POPULATION ANALYSIS METHODS USED SUCCESSFULLY:** Several new length-based methods -- requiring only rudimentary age-length data -- for population analysis have been used successfully in conjunction with stock assessments of northern shrimp and sea scallops (Dr. Mark Terceiro, FTS 840-1203 or (508) 548-5123).
70. **SUMMER FLOUNDER AGE DETERMINATION METHODS STANDARDIZED:** At a regional workshop sponsored by the Center and the Atlantic States Marine Fisheries Commission and held in Woods Hole during June 11-13, participants agreed upon standard methods and criteria for determining the age of summer flounder (Frank P. Almeida, FTS 840-1308 or (508) 548-5123).
71. **AMERICAN AND CANADIAN AGE DETERMINATIONS OF GROUND FISH CROSS-CHECKED:** The Center and Canada's Department of Fisheries and Oceans exchanged age structures of Atlantic cod, haddock, and pollock to cross-check each other's age determinations of these species. Consistent age determinations between our two countries are vital for accurate portrayal of the age structure of transboundary populations of these species (Frank P. Almeida, FTS 840-1308 or (508) 548-5123).

72. **NEW SYSTEM BETTER MANAGES AGE DETERMINATION DATA:** We developed and implemented a quicker and more accurate computerized system for managing age determination data derived from samples collected on research vessel surveys, commercial fishery port sampling, and domestic and foreign commercial fishery sea sampling (Frank P. Almeida, FTS 840-1308 or (508) 548-5123).
73. **ATLAS DEPICTS MARINE DISEASES:** An atlas of marine mollusk, crustacean, and fish histopathology has been prepared which describes lesions caused by viruses, bacteria, protozoans, and metazoans, and those associated with contaminants and tumors. The atlas has 114 color photomicrographs to illustrate important features of the lesions (Sharon A. MacLean, FTS 838-6258 or (401) 782-3258).
- \*74. **EFFECTS OF ATLANTIC MACKEREL BLOOD PARASITES DOCUMENTED:** We established the prevalence and histopathological effects of hemogregarine parasites in the blood and tissues of Atlantic mackerel sampled from the widely separated Northwest Atlantic and Northeast Atlantic stocks. Prior to our research, hemogregarines were considered benign parasites of wild fish (Sharon A. MacLean, FTS 838-6258 or (401) 782-3258).
75. **FIN ROT EFFECTS ON WINTER FLOUNDER BLOOD EXAMINED:** A report was prepared on change in blood parameters in winter flounder as an indicator of the severity of fin rot disease. The report also covered normal seasonal hematological variation (John B. Mahoney, FTS 342-3055 or (908) 872-3055).
76. **DISEASE FOUND IN NEW MARINE HOSTS:** Ten species of marine fish have been reported for the first time to be infected by a chlamydia-like organism which causes epitheliocystis (Earl J. Lewis, (301) 226-5193).
77. **WORKSHOP ON SHELL DISEASE HELD:** We organized and convened a half-day session on shell disease at the 1990 National Shellfish Association annual meeting in Williamsburg, Virginia (Dr. Carl J. Sindermann, (301) 226-5193).
78. **ATLAS OF BLUE CRAB DISEASES PREPARED:** An atlas has been prepared which gives a brief synopsis of the principle diseases of blue crabs (Gretchen A. Messick, (301) 226-5193).
79. **NEW INTERNAL PARASITE FOUND IN BLUE CRABS:** Blue crabs dredged from Chesapeake and Delaware Bays have been found for the first time to be infected with a parasite similar to *Paranophrys* sp. which, in other crustaceans, causes death by consuming the host's "blood" cells (Gretchen A. Messick, (301) 226-5193).

80. **PERKINSOSIS WIDESPREAD, HAPLOSPORIDIOSIS RARE IN CHESAPEAKE'S EASTERN OYSTERS:** The 1990 cooperative survey with the Maryland Department of Natural Resources of eastern oyster disease in Chesapeake Bay revealed rare occurrence and low levels of haplosporidiosis (caused by *Haplosporidium nelsoni*) and wide distribution and high intensity of perkinsosis (caused by *Perkinsus marinus*) in the Maryland portion of the bay (C. Austin Farley, (301) 226-5193).
81. **PATHOGENS RELATED TO GEORGIA'S EASTERN OYSTER DEATHS:** We reported on the historical and recent occurrence of two eastern oyster pathogens, *Perkinsus marinus* and *Haplosporidium nelsoni*, in Georgia waters, and their relationship to oyster deaths there during 1985-87 (Earl J. Lewis, (301) 226-5193).
82. **HAPLOSPORIDIOSIS LESSENS IN WELLFLEET'S EASTERN OYSTERS:** An examination of eastern oysters from Wellfleet, Massachusetts, showed less than two percent of the animals (3 out of 175 samples) to be infected with *Haplosporidium nelsoni*, compared to an 8-28 percent prevalence in previous years (Earl J. Lewis, (301) 226-5193).
83. **CLINICAL ASPECTS OF PERKINSOSIS IN EASTERN OYSTERS DOCUMENTED:** We established the clinical aspects of perkinsosis in eastern oysters, showing the relationship between each stage of the disease and the likelihood of death, and for those specimens which do die from the disease, the relationship between each stage of the disease and the number of days until death (C. Austin Farley, (301) 226-5193).
84. **TRANSMISSIBLE SARCOMA REPEATS CYCLE IN CHESAPEAKE SOFTSHELLS:** High levels of sarcoma in Chesapeake Bay softshells in the spring led to softshell deaths in the summer and a resurgence of the disease in the fall and winter -- a pattern seen in previous years (Shawn M. McLaughlin, (301) 226-5193).
85. **EVIDENCE FOR VIRUS NOT FOUND IN SOFTSHELL SARCOMA:** Whole hemolymph (circulatory fluid of invertebrates equivalent to blood and lymph of vertebrates) collected from softshells infected with sarcoma disease produces sarcomas when injected into noninfected softshells, while cell-free hemolymph from infected softshells does not produce sarcomas, thus supporting the hypothesis of a nonviral cause of the disease (Shawn M. McLaughlin, (301) 226-5193).

86. **NEW PARASITES SEEN IN CHESAPEAKE SOFTSHELLS:** A parasitic organism similar to *Perkinsis marinus* which causes the eastern oyster disease perkinsosis, and a previously unreported rickettsial-like organism, have been discovered by us during histological examination of oysters (Shawn M. McLaughlin, (301) 226-5193).
87. **SYMPOSIUM FOCUSES ON MOLLUSK INTRODUCTIONS AND TRANSFERS:** A symposium on "Introductions and Transfers of Mollus[k]s: Risk Considerations and Implications" was organized and convened. A volume of the contributed papers will be published (Dr. Aaron Rosenfield, (301) 226-5193).
88. **ROLE OF TRANSFERS IN OYSTER DIE-OFFS EXAMINED:** A report has been prepared which examines die-offs among oyster populations caused by introduction of infectious diseases resulting from transfers of oysters from one area to another (C. Austin Farley, (301) 226-5193).
- \*89. **INDO-PACIFIC SHORE CRAB FOUND IN NEW JERSEY:** An ovigerous female of the common western Pacific shore crab *Hemigrapsis sanguineus* was found near Cape May, New Jersey. This area should be monitored to see if this crab has become established (Dr. Austin B. Williams, FTS 357-2550 or (202) 357-2550).
90. **INFORMATION NEEDS FOR ARTIFICIAL-REEF MANAGEMENT REPORTED:** Information needs of artificial-reef managers have been compiled, based on a national survey for the Atlantic States Marine Fisheries Commission (Frank W. Steimle, Jr., FTS 342-3059 or (908) 872-3059).
91. **REESTABLISHMENT OF EELGRASS IN RARITAN BAY QUESTIONABLE:** A pilot project to plant eelgrass from Barnegat Bay, New Jersey, to five sites in Raritan Bay, New Jersey -- where eelgrass was formerly abundant -- yielded some survival and growth of transplants, but reestablishment of large beds may not be feasible due to turbidity, waves, smothering by sea lettuce, and invertebrate fouling (Clyde L. MacKenzie, Jr., FTS 342-3019 or (908) 872-3019).
92. **WARMER WATERS WOULD ALTER PREY DISTRIBUTION, FOOD CHAINS:** Based on fish distributions and water temperatures observed on our spring and autumn bottom trawl surveys during 1963-90, it appears that important prey species such as Atlantic mackerel and Atlantic herring might overwinter much farther north if water temperatures warm significantly due to global climate change, thereby potentially altering the Northeast's marine food chains (Dr. Steven A. Murawski, FTS 840-1303 or (508) 548-5123).

- \*93. **TEMPERATURE TRENDS OF SHELF WATERS DOCUMENTED:** Based on water temperature measurements during our spring and autumn bottom trawl surveys between 1963 and 1989, Northeast Continental Shelf waters were relatively cool during the late 1960s, relatively warm during the mid-1970s, and intermittent between the two extremes during the 1980s (Dr. David G. Mountain, FTS 840-1271 or (508) 548-5123).
- \*94. **WATER WARMER THAN NORMAL IN NEW YORK BIGHT:** Our monitoring of physical oceanographic conditions off the northeastern United States during 1989 found that shelf-water front locations were near normal, that 14 warm-core Gulf Stream rings were present in slope water (of which 10 formed in 1989), that water temperatures tended to be warmer than normal in the New York Bight and cooler than normal at the beginning and end of the year in the Gulf of Maine, and that salinities tended to be higher than normal in both areas (Reed S. Armstrong, FTS 838-6280 or (401) 782-3280).
- \*95. **SPRING/NEAP TIDES AFFECT GEORGES BANK THERMAL STRATIFICATION:** Based on satellite infrared data for southern Georges Bank, changes in sea-surface temperatures (which infer changes in water-column temperatures, i.e., stratification) are correlated with spring/neap changes in tidal-current mixing (James J. Bisagni, FTS 838-6313 or (401) 782-3313).
- \*96. **SEA-LEVEL ANOMALIES LINKED TO WATER TEMPERATURE ANOMALIES:** Based on satellite radar data for the western North Atlantic, sea-level anomalies seem to propagate westward and relate to the passage of large-scale sea-surface and water-column temperature anomalies (James J. Bisagni, FTS 838-6313 or (401) 782-3313).
- 97. **SATELLITE IMAGES CALIBRATED TO GROUNDTRUTH:** Satellite images of surface chlorophyll, temperature, conductivity, and turbidity in Raritan Bay and the New York Bight apex were calibrated to groundtruth by simultaneous collections of surface water during a cooperative study with the New Jersey Institute of Technology. Algorithms needed to calibrate future satellite images have also been developed (Christine E. Zetlin, FTS 342-3095 or (908) 872-3095).

98. **PHASED-OUT INSHORE DUMPSITE SHOWS SOME RECOVERY:** Findings during the final year of a three-year study of the recovery of the 12-Mile Dumpsite -- a sewage-sludge dumpsite off New York City -- following phaseout of dumping at the site during 1986-87 include:
- \*a. The third annual progress report has been completed on studies of responses of habitats and biota of the inner New York Bight to the 1986-87 phaseout of sewage-sludge disposal at the dumpsite (Anne L. Studholme, FTS 342-3001 or (908) 872-3001).
  - b. Sediments from the dumpsite contain higher levels of organic contaminants -- indicators of sewage sludge -- than sediments from a nearby relatively unpolluted site (Dr. Ashok D. Deshpande, FTS 342-3043 or (908) 872-3043).
  - c. The rate of biological use of sediment-borne carbon at the dumpsite, which can be directly related to sewage sludge levels, has decreased, indicating some recovery of sediments (Dr. William C. Phoel, FTS 427-2363 or (301) 427-2363).
  - d. Wind and wave action greatly affect and make highly variable both the direction and amount of redistribution of sediment, including sediment containing sewage sludge or sludge-derived contaminants, in the dumpsite area (Dr. James P. Manning, FTS 840-1211 or (508) 548-5123).
  - e. Livers of winter flounder and American lobster collected at the dumpsite contain higher levels of polychlorinated biphenyls (PCBs) than livers of those species collected at a nearby relatively unpolluted site. Lobster PCB levels are also higher than flounder PCB levels (Andrew F.J. Draxler, FTS 342-3054 or (908) 872-3054).
  - \*f. Bottom invertebrate species in the "most altered" portion of the dumpsite area have increased and are now approaching the number of such species at a nearby relatively unpolluted site. However, bottom invertebrate abundance in the most altered area remains sparse and the benthic invertebrate community bears little resemblance to such communities in other parts of the New York Bight (Robert N. Reid, FTS 342-3020 or (908) 872-3020).
  - g. Growth rates and production of polychaetes in the dumpsite area show no noticeable effects of sewage sludge disposal (Frank W. Steimle, Jr., FTS 342-3059 or (908) 872-3059).

- h. Diets of several fish species and American lobster in the dumpsite area do not seem to be adversely affected by sewage sludge disposal (Frank W. Steimle, Jr., FTS 342-3059 or (908) 872-3059).
  - i. Diets of Atlantic rock, Jonah, and lady crabs collected in the dumpsite area consist of polychaetes, mollusks, crustaceans, fishes, squids, and echinoderms in descending order as percent of stomach-content volume (Linda L. Stehlik, FTS 342-3081 or (908) 872-3081).
99. **DEEPWATER DUMPSITE MONITORED FOR SLUDGE EFFECTS:** As sewage-sludge disposal at the inshore 12-Mile Dumpsite was phased out, disposal was proportionately redirected to the deepwater 106-Mile Dumpsite. We continue to monitor the deepwater site to detect changes due to the increased dumping. Findings from this past year's studies include:
- \*a. Of the 1.7 billion gallons of sludge dumped at the deepwater site in 1989, 81 percent was dumped in slope water, 10 percent in warm-core Gulf Stream rings, and 9 percent in shelf water (LTJG Cynthia Ruhsam, FTS 838-6290 or (401) 782-3290).
  - b. For the second year in a row, lanternfishes collected at the deepwater site have higher body burdens of contaminant heavy metals than lanternfishes collected beyond the site (Vincent S. Zdanowicz, FTS 342-3032 or (908) 872-3032).
  - c. Collections were dominated by two species of rattail fishes, *Coryphaenoides carapinus* and *C. armatus*, and the blue hake, *Antimora rostrata* (Donald G. McMillan, FTS 342-3046 or (908) 872-3046).
100. **WINTER FLOUNDER FROM POLLUTED WATER SPAWN POORLY:** In comparing winter flounder collected from a polluted site (Black Rock Harbor, Bridgeport, Connecticut) and a relatively clean site (Milford Harbor, Milford, Connecticut), we find Black Rock fish to have a smaller proportion of females actually spawning (whether naturally or artificially induced), a smaller proportion of live eggs at the time of extrusion, and a much smaller proportion of successful egg cultures (only 45 percent versus Milford's 91 percent) (Dr. Frederick P. Thurberg, FTS 642-5244 or (203) 783-4244).

101. **CONTAMINATED HABITAT YIELDS DEFORMED/DEAD YOUNG WINTER FLOUNDER:** Black Rock Harbor in Bridgeport, Connecticut, which is arguably the most chemically contaminated site among other sites examined by us in Long Island Sound, shows the highest level of developmental abnormality and mortality in the early life stages of winter flounder (Dr. Arlene Longwell, FTS 642-5207 or (203) 783-4207).
102. **CONTAMINANTS LIMIT WINTER FLOUNDER REPRODUCTION:** Pesticides, aromatic hydrocarbons, and polychlorinated biphenyls, in decreasing order of importance, are the chemical body burdens which most limit the reproductive success of female winter flounder in Boston Harbor and Long Island Sound (Dr. Arlene Longwell, FTS 642-5207 or (203) 783-4207).
103. **FIN EROSION LINKED TO CONTAMINANTS, NOT MICROBES:** Our analysis of fin erosion disease in winter flounder collected from polluted waters shows the cause to be contaminants, not microbes (Dr. Joel E. Bodammer, (401) 792-2114).
104. **MECHANISM FOR CADMIUM TOLERANCE IN PHYTOPLANKTON DETERMINED:** Collaborative research with the Los Alamos National Laboratory shows that several algal strains can survive high cadmium concentrations by producing metal-binding polypeptides similar to those found in higher plants and microbes (Gary H. Wikfors, FTS 642-5225 or (203) 783-4225).
105. **CADMIUM INHIBITS PRODUCTION OF WINTER FLOUNDER EGG YOLK:** Compared to control fish, female winter flounder exposed to high levels of cadmium in their holding water over a 10-week period show lower levels of serum vitellogenin, a protein needed to produce yolk for their eggs (Jose J. Pereira, FTS 642-5238 or (203) 783-4238).
106. **INSHORE AND OFFSHORE SEA SCALLOPS REACT DIFFERENTLY TO POLLUTANTS:** Exposure of sea scallops from offshore New Jersey to low levels of copper and cadmium in seawater reduces substances in the blood serum which normally help to clear bacteria from the blood. A similar reduction has not been found in sea scallops from a Maine estuary (Dr. Richard A. Robohm, FTS 642-5237 or (203) 783-4237).
107. **METALS IN BOSTON HARBOR WINTER FLOUNDER EGGS NOT HIGH:** Heavy metal levels in winter flounder eggs from Boston Harbor are generally low, not statistically different between inner and outer harbor sites, and similar to levels reported from a range of fairly clean to contaminated habitats (Joseph J. Vitaliano, FTS 342-3022 or (908) 872-3022).

108. **SOFTSHELL SARCOMA RELATED TO PESTICIDE:** Our study of the factors involved in the occurrence and spread of sarcoma in softshells shows a relationship between sarcoma prevalence and tissue burdens of the chlorinated hydrocarbon pesticide chlordane (C. Austin Farley, (301) 226-5193).
109. **RED-TIDE PHYTOPLANKTON HARMS COASTAL BIVALVES:** In investigating the effects of a recent bloom of the dinoflagellate *Prorocentrum* in Long Island Sound, we find -- in laboratory experiments -- that one strain of *Prorocentrum* is harmless to northern quahogs, but that another strain supports no growth of quahogs and causes rapid death in bay scallops (Gary H. Wikfors, FTS 642-5225 or (203) 783-4225).
110. **EFFECTS OF LOW OXYGEN ON JUVENILE WINTER FLOUNDER EXAMINED:** Yearling winter flounder die during a 20-hour exposure at 20°C to a dissolved oxygen (DO) range of 1.1-1.5 ppm. However, they withstand an eight-hour exposure at 20°C to a DO range of 1.2-1.4 ppm (John J. Ziskowski, FTS 642-5256 or (203) 783-4256).
- \*111. **LOW OXYGEN REDUCES GROWTH OF YOUNG WINTER FLOUNDER:** In laboratory experiments, young-of-the-year winter flounder held under constant low levels (2.2 mg/l) of dissolved oxygen for 11-12 weeks grow only about half as much as flounder held under high levels (6.7 mg/l). There is intermediate growth when oxygen fluctuates daily between high and low levels (Allen J. Bejda, FTS 342-3080 or (908) 872-3080).
112. **JUVENILE BAY SCALLOPS TOLERATE LOW OXYGEN SHORT TERM:** In comparing juvenile bay scallops and juvenile American lobsters in short-term exposure to low dissolved oxygen (DO) levels, we find surprising resilience in the scallops, which survive 24 hours at a mean DO level of 1.7 ppm (range of 1.6-1.9 ppm), whereas only 30 percent of lobsters survive the same conditions (John J. Ziskowski, FTS 642-5256 or (203) 783-4256).
- \*113. **PUBLISHING IN GRAY LITERATURE DISCOURAGED:** A discussion of the role of gray literature (e.g., papers not reviewed anonymously by outside experts) in fishery science has been published which encourages fishery agencies and scientists not to produce papers for publication in gray literature when they can be produced in such a way that they will be published in the formal literature (Dr. Bruce B. Collette, FTS 357-2524 or (202) 357-2524).

**Information Services Section  
Northeast Fisheries Center  
National Marine Fisheries Service, NOAA  
Water St.  
Woods Hole, MA 02543**



**POSTAGE AND FEES PAID  
U.S. DEPARTMENT OF COMMERCE  
COM-210**

**FIRST CLASS MAIL**